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ABSTRACT

A 3-year national assessment of vocational education (VE) examined various issues related to improvement of VE programs, their academic and employment outcomes, participation of special population students in VE, and Perkins funding and administration. The assessment established that most secondary VE is still very traditional and that Perkins Act-mandated reforms have yet to take hold. In many areas, efforts to integrate curricula and develop tech prep programs were proceeding slowly. Vocational enrollments were continuing to decline, and more disadvantaged and disabled students and fewer high-achieving students were taking VE courses. Compared to secondary-level VE, postsecondary-level VE was found to be stronger, more structured, associated with better economic outcomes for students, and experiencing increasing enrollments of a broader cross-section of students. Among those issues/problems identified as requiring further attention were the following: preparation of postsecondary-level VE faculty, development of tech prep programs, development of performance standards and measures, integration of academic education and VE, school-to-work transition, access for special populations, supply of teachers, and training for "all aspects of industry." (This document contains an executive summary and 15 reports. Many reports contain substantial numbers of references and appended tables/figures. The bibliography lists 154 references.) (MN)

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INTERIM REPORT
TO
CONGRESS

WASHINGTON, D.C.

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NATIONAL ASSESSMENT
OF VOCATIONAL EDUCATION

INTERIM REPORT
TO
CONGRESS

WASHINGTON, D.C.

Office of Research

Office of Educational Research and Improvement
U.S. Department of Education

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PREFACE

This is the first of two reports on the status of vocational education, mandated by Congress in the 1990 Perkins Act and prepared in the Office of Educational Research and Improvement (OERI). A Final Report will be completed by July 1, 1994. Several people worked on each of the chapters in this Interim Report, but each has a principal author or authors. The chapters and their principal authors are as follows:

Executive Summary — David Boesel

Chapter 1. Introduction — Lisa Hudson

Chapter 2. Pattern of Perkins Funds Allocations — Lana Muraskin (SMB Economic Research) with Duc-Le To

Chapter 3. The State Administration of Vocational Education — Duc-Le To

Chapter 4. Participation in Secondary Vocational Education — Lisa Hudson

Chapter 5. Participation in Postsecondary Vocational Education — Lisa Hudson

Chapter 6. State and Local Responsibilities Concerning Special Populations — Lisa Hudson

Chapter 7. Programs for Sex Equity and Single Parents, Single Pregnant Women, and Displaced Homemakers — Lisa Hudson

Chapter 8. Teachers in Vocational Education — David Boesel

Chapter 9. Teaching Practices and Class Characteristics of Secondary Vocational Education — David Boesel

Chapter 10. The Effects of Education Reform on Vocational Education — David Boesel

Chapter 11. Performance Standards and Measures — Brian Stecher, Hilary Farris, and Eric Hamilton (The RAND Corporation)

Chapter 12. Integration of Academic and Vocational Curricula — David Boesel

Chapter 13. Tech-Prep Programs — David Boesel

Chapter 14. Work Experience Programs — Sharon Deich (Pelavin Associates) and Charles Masten

Chapter 15. Employment Outcomes — Sharon Deich (Pelavin Associates) and Charles Masten

To help frame the issues and the methodology of the Assessment, a Design Conference for the National Assessment of Vocational Education was held March 13–15, 1991.

In the course of the study, the National Assessment of Vocational Education Advisory Panel, a distinguished panel of experts and practitioners, has met seven times to advise on all aspects of the study, including two reviews of drafts for this Interim Report. The panel is scheduled to meet two more times before the Final Report is completed.

While conducted within OERI, this assessment is an independent study and does not necessarily reflect the views of the U.S. Department of Education. This edition contains editorial changes to the Advanced Copy of the report delivered to Congress December 30, 1993. In addition, the Executive Summary has been reorganized, and some new information has been added to the summary.

David Boesel
Director, National Assessment
of Vocational Education
January, 1994

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The National Assessment of Vocational Education has been developed and administered by the following staff members of the Office of Research, OERI:

David Boesel
Beverly Farrar
Debra Hollinger
Lisa Hudson
Charles Masten
Ron Myers
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The National Assessment staff were assisted in this task by a great many people in a number of organizations. Too many people were involved to thank individually, but our gratitude for a job well done extends to all involved, in addition to those acknowledged below.

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Leslie Retallick of MPR Associates conscientiously oversaw the formatting and printing of the National Assessment's Omnibus Surveys. Westat, Inc. performed the daunting task of administering and analyzing the Omnibus Surveys; we would particularly like to thank Lance Hodes, Melanie Martindale, Adam Chu, William Strang, and Diane Ward for their excellent work. Westat and MPR Associates also conducted the community case studies and funding case studies. Key individuals we wish to thank for these efforts include Lance Hodes, Melanie Martindale, Project Director, and Joan Michie of Westat; Gary Hoachlander and Paula Hudis of MPR Associates; and Ann Milne of AMM Associates. We are also grateful to the thousands of educational administrators and other school and community personnel who responded to lengthy questionnaires and agreed to participate in site visits; we recognize the imposition these data collection efforts caused for respondents, and appreciate their willingness to share their time and knowledge with us.

The National Assessment included many other surveys as well as analyses of existing databases. For assistance with the National Assessment of Vocational Education Teacher Survey, we would like to thank Judi Carpenter of the U.S. Department of Education and Elizabeth Farris, Sheila Heaviside, and Wendy Mansfield of Westat. For thorough and painstaking analyses of the National Postsecondary Student Aid Study and on the 1982, 1987, 1990 transcript studies, we thank John Tuma of MPR Associates, and for similar efforts on the schools and staffing surveys and we thank Robin Henke of MPR Associates. Thanks also to Steven Klein of MPR Associates, Charles Benson of the National Center for Research in Vocational Education, and Trudy Anderson of the National Association of State Directors of Vocational and Technical Education for their assistance with the collection of state finance records data. We are also indebted to the National Alliance for Partnerships in Equity, particularly Tina Lankard, Mary Ann Etu, and Mary Wiberg, for sharing with us their survey of state sex equity administrators.

The National Center for Research in Vocational Education provided critical research on additional issues relevant to the National Assessment. We would especially like to thank the key authors of the NCRVE research reports: Marion Asche, Norton Grubb, Gerald Hayward, Cathy Stasz, Brian Stecher, David Stern, and David Stevens. Joan Friedenberg of California State University at San Marcos, Nancy Karweit of the Johns Hopkins University, and Richard Lynch of the University of Georgia also provided important research papers.

Along the way, numerous people helped us remain on target, on time, and of sound mind. The conduct of the assessment was aided by the support and assistance of Daniel Chenok and Cynthia Brown of the Office of Management and Budget; Donald Brannon and Barbara Shay of the Council of Chief State School Officers' Education Information Advisory Committee (EIAC); Joseph Cassello, Tom Corwin and Tom Johns of the U.S. Department of Education; and Anne App of Word for Word, the Advisory Panel's diligent recorder.

Gary Hoachlander of MPR Associates provided expert information and guidance throughout the study. Madeleine Hemmings of the National Association of State Directors of Vocational and Technical Education has also been a continuing source of information and insight on vocational education. We are particularly grateful to the Advisory Panel (see separate listing) for their constructive comments, recommendations, and assistance throughout the three years of the study.

The text and structure of the Interim Report were enhanced by the review and comments of the National Assessment's Advisory Panel and the following OERI staff: Nabeel Alsalam, Mary Frase, and Jim Houser of NCES, and Judith Anderson, Joseph Conaty, and Nevzer Stacey of OR. We thank these individuals for helping us improve the clarity, focus, and coherence of the current report.

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EXECUTIVE SUMMARY

INTRODUCTION[1]

The Economic Context

Over the last two decades, changes in America's economy and its position in the international economic system have focused attention on the way American education prepares young people for work. Perhaps the most fundamental of these changes have been the emergence of the global economy and the decline in the nation's international competitiveness.

For more than 20 years after World War II, the United States faced only limited foreign competition, in part because the war had weakened many economically developed nations and in part because many other countries, or colonies, were underdeveloped. However, the recovery of industrialized European and Asian nations, together with the decolonization and economic development of others, greatly intensified the competition. By the 1970s America's share of the world market had begun to shrink, and its relative economic position continued to decline through the 1980s. Although there have been recent improvements in some sectors of the economy, the nation's competitiveness remains an issue of critical importance.

Our competitors include high-skill manufacturing economies with well-educated workforces, often employing new technology and new forms of work organization to produce high-quality products. Japan's export-oriented manufacturing sector is an example of this kind of economy. Our competitors also include nations with less well educated but disciplined workforces able to perform the sort of semi-skilled work that has been the backbone of American manufacturing, and willing to do so for lower wages. Thus, many American manufacturing jobs have migrated to countries such as Taiwan, Korea, and Mexico. One major report has observed that if America is to avoid competing primarily with low-wage labor in other countries, we will have to invest more in educating and training America's workforce to compete better with the high-skill economies.[2]

In addition to increased international competition, the second factor that has focused attention on the education of American youth has been technological change. While improvements in technology are an old story, today's technology is becoming ever more pervasive and sophisticated. Particularly dramatic has been the proliferation of computers and telecommunications equipment. While these technologies simplify some tasks, on balance they require more education and training than workers previously needed.

The prospect of new forms of work organization has been a third economic factor focusing attention on the education of American youth. The traditional organization of work in fields such as manufacturing has been based on extensive division of labor, narrow specialization, routine repetition of tasks, and authoritative top-down management. This system casts the worker as a cog in a machine, and it requires reliable, responsible behavior more than thinking skills from front-line workers. Management is primarily responsible for supervision, thinking, and leadership.

Recently, many American companies have begun to adopt a new model of workplace organization in response to the pressures of competition. Following the principles of W. Edwards Deming, the new system makes much greater use of the skills and abilities of front-line workers. It eliminates layers of management and assigns front-line workers more responsibility for supervisory functions such as improving operations, solving problems, and assuring quality control. Teamwork and job rotation are often key elements in the new model.

Obviously this system requires more thinking, communication, and collaboration among workers than the old one; hence it requires better educated workers. While the high-performance workplace is not yet the dominant mode of production and service delivery in this country, its recent growth can be gauged from estimates of its prevalence. In the late 1980s only 5 percent of employers were estimated to have restructured their workplaces along these lines.[3] In 1993, 37 percent of companies were estimated to be incorporating major components of the high-performance workplace.[4]

In the context of these economic changes, the premium on education in the United States has increased. While the earnings of American workers in general fell between 1973 and 1990, those with the least education experienced the greatest losses. For example, among white males, the median earnings of workers aged 25–34 with less than a high school diploma decreased 42 percent; earnings of high school graduates declined 31 percent; earnings of those with some college declined 21 percent; and earnings of college graduates decreased 14 percent.[5]

College graduates, who could move into professional, managerial, and technical jobs, managed to get by in this period with some loss of earnings. But high school graduates, who earlier could move into relatively stable, well-paying manufacturing jobs, increasingly tended to move from one low-paying job to another, often in the service sector, as manufacturing jobs disappeared. The situation for high school dropouts was even worse. The disadvantaged and minorities were especially hard-hit by these changes. For example, while the median earnings for white male workers aged 25–34 decreased 26 percent between 1973 and 1990, the median earnings for comparable African American workers decreased 33 percent in the same period.

In response to the country's declining economic competitiveness, the poor performance of our students on international achievement tests, and complaints from business and military leaders about the lack of basic skills among high school graduates, the U.S. Department of Education called for education reform in the early 1980s.[6] It especially emphasized higher standards for education and more rigorous academics for elementary and secondary students.

State governments responded quickly to this call, raising requirements for high school graduation and admission to state colleges and universities. Soon thereafter, other educators charged that the new reforms tended to focus on college-bound students and to ignore the majority of secondary students who do not attain baccalaureate degrees. They called for structural reforms to improve the way the education system prepares secondary and non-baccalaureate postsecondary students for work. The 1990 Carl D. Perkins Act embodies many of these reforms.

The Perkins Act

Successor to the 1984 Perkins Act, the new Act seeks to strengthen the academic and technical skills of students in vocational education by 1) requiring the development of statewide performance standards and measures; 2) integrating academic and vocational curricula; 3) promoting two-plus-two tech-prep programs that link high schools with postsecondary institutions; and 4) supporting work experience programs, such as apprenticeships and cooperative education.

The Act focuses particularly on improving the occupational education of those hit hardest by declining wages in low-skill jobs. Termed "special population students," they include the economically and educationally disadvantaged, the disabled, the limited-English-proficient (LEP), individuals in programs designed to eliminate sex bias, and individuals in correctional institutions. The Act's dual emphasis on program improvement and special populations has been a key feature of federal assistance to vocational education for over two decades, and it parallels the Department of Education's twin goals of excellence and equity in education.

The National Assessment of Vocational Education

In order to evaluate the Perkins initiatives and to provide information for the next round of legislation in the mid-1990s, the Act calls upon the Department of Education's Office of Educational Research and Improvement (OERI) to conduct a National Assessment of Vocational Education. The assessment is required to address a series of issues related to the improvement of vocational education programs; their academic and employment outcomes; the participation of special population students in vocational education; and Perkins funding and administration.

In response to this mandate, OERI has collected information and conducted analyses over a period of three years. This Interim Report, the first of two reports required by the 1990 Perkins Act, contains research findings available as of October, 1993. It is a preliminary version of the final report to be completed July 1, 1994. The Final Report will update and modify this one, including additional research findings obtained through February, 1994. Because the Interim Report is a work in progress, it does not contain policy recommendations. Such recommendations will be included in the Final Report.

The Executive Summary has two parts. The first briefly discusses the condition of vocational education in secondary schools and nonbaccalaureate postsecondary institutions. The second addresses questions posed in the Perkins mandate and issues related to those questions. The Summary is organized differently from the report and sometimes pulls together findings from several chapters to answer a question or develop a theme.

I. OBSERVATIONS ON THE CONDITION OF VOCATIONAL EDUCATION

Secondary Vocational Education

Most secondary vocational education occurs in vocational programs in regular comprehensive high schools. Some is provided in area vocational schools, where students typically spend half a day on vocational courses, followed or preceded by half a day in their regular comprehensive high schools. Area vocational schools are more likely to be located in suburban than in urban or rural areas. A small number of students attend all-day vocational high schools, which are typically located in urban areas and which focus on vocational education, while providing essential academic courses.

Secondary vocational districts receive more Perkins money than regular comprehensive districts, on average. They also tend to receive more support and assistance from state vocational education agencies and to be more active in implementing Perkins reforms such as integration of academic and vocational curricula, and tech-prep programs. Perkins basic grant funds are associated with greater reform efforts at the local level. State support for Perkins reforms and the perceived influence of the Perkins Act are also associated with greater local reform efforts. States especially have the potential to restructure secondary education programs in ways that can improve workforce preparation.

Nevertheless, most secondary vocational education is still very traditional. The Perkins reforms have not really taken hold yet. For example, many districts are engaged in activities to integrate their curricula and develop tech-prep programs, but in most cases the efforts are new and small, typically involving only a few courses. There is resistance to integration and a plethora of complex problems in implementing tech-prep programs. Most school systems are trying to fit the Perkins reforms into their existing curricula, rather than changing the curricula substantially. Whether these small efforts will prove to be the beginnings of larger reforms or long-term adaptations to the status quo is yet to be seen.

How well is secondary vocational education preparing students for the workforce? There is little evidence that vocational education *per se* improves the earnings or employment status of graduates. The key to improved outcomes seems to be finding a training-related job, and less than 40 percent of secondary vocational students do so. Concentrating vocational coursetaking in a program area tends to increase earnings in training-related jobs and increases the probability of finding a related job. However, only half of regular districts require course concentration for program completion, and over the last decade there has been a tendency toward less concentration.

While further research is needed on this subject, it seems that reforms designed to give more structure to vocational education and to bring vocational training into closer alignment with the job market are needed. Labor market returns to academic skills are currently being investigated, and the roles of both academic and vocational education in workforce preparation will be discussed in the Final Report.

Whether prompted by insufficient economic returns, increased emphasis on academics, or other factors, a broad shift away from vocational education and toward academics has occurred in the last decade. After a period of growth in the 1960s and 1970s, secondary vocational education has been shrinking. Students are taking fewer vocational courses than in the early 1980s; there are fewer vocational teachers and fewer university programs training them; fewer state employees work in vocational education. This trend continues even though total secondary enrollments are beginning to grow, after a period of decline due to the "baby-bust" generation.

As vocational enrollments decline, their composition is changing. More disadvantaged and disabled students and fewer high-achieving students are taking vocational courses. The Perkins Act may be among the factors contributing to this tendency. The Act requires state plans to include assurances that local districts will conduct outreach efforts to recruit special population students to vocational programs and that supplemental services will be provided to them in those programs.[7] Since Chapter I funds for compensatory education are concentrated at the elementary level, Perkins-funded vocational programs appear to be the chief source of federally funded services for disadvantaged secondary students who are not also disabled and/or of limited English proficiency.

Vocational teachers and administrators are worried about this change in student composition and about the status of vocational programs in the larger education system. Our case studies show evidence of stigmatization where large numbers of special population students are concentrated in vocational programs. Some of these studies suggest that there may be a "tipping point" after which other students avoid vocational programs. Where this occurs, vocational programs may be more isolated than before, an outcome opposite to that envisioned in the Perkins Act.

A closely related issue is the "dumping" of problem students into vocational education programs, a practice often encountered in our case study sites. We do not know how widespread the practice is, but 55 percent of vocational teachers in our national survey say that the placement of problem students in vocational programs regardless of appropriateness is a serious problem. Of 13 potential problems listed in the survey, this is the one most often regarded as serious.

The fundamental question in placing of students in vocational education programs (or any others) is whether the interests of the students are well served. This is a complicated question. The research on economic outcomes indicates that disabled students and certain others tend to benefit from vocational programs, but there is little evidence of overall benefits to economically and educationally disadvantaged students, or to limited-English-proficient students. Some of them may be better served by taking more academic courses. The risk in broad-brush efforts to include more and more special population students in vocational education is that an increasing number of placements will not be the best interests of the students involved.

Postsecondary Vocational Education

Most postsecondary vocational (occupational/technical) education is provided in public, two-year community colleges. Private proprietary schools are the second largest providers, followed by public technical institutes and area vocational schools serving postsecondary students. Because almost all Perkins funds go to public institutions, the assessment focuses on them, rather than on private institutions. The largest providers, community colleges, serve students in a wide range of ages who attend for a variety of purposes. Only a minority of students enter community colleges directly after high school, and many enrollees do not complete associate's degrees.

While secondary vocational districts are more likely than regular comprehensive districts to receive Perkins funds and be involved in Perkins reforms, at the postsecondary level the situation changes. It is the comprehensive institutions — the community colleges — that are the most likely to receive Perkins funds, to integrate their curricula, and especially to develop tech-prep programs. In contrast to the pattern in secondary districts, the allocation of Perkins basic grants across postsecondary institutions is not strongly associated with integration and tech-prep efforts. Basic grants seem to be less a stimulus to reform at this level. Moreover, state postsecondary agencies have less influence than secondary agencies over their local institutions and hence have less potential as agents of reform. However, vocational education also appears to be stronger at the postsecondary than at the secondary level.

Postsecondary vocational programs provide more structure than their secondary counterparts for students who want a program of vocational training. Occupational majors and course prerequisites are common in postsecondary programs. Postsecondary institutions are also more likely to be taking steps to integrate across curricula, rather than within academic and vocational courses.

The economic outcomes for postsecondary vocational students are also better than for secondary students. Postsecondary completers are more likely to find jobs related to their training, and even some coursetaking without completing a program seems to confer labor market benefits. These advantages of postsecondary vocational education seem to be most pronounced in public community colleges.

Vocational education at the postsecondary level is in better shape than at the secondary level in a number of other ways, as well. Vocational enrollments are increasing along with total enrollments. Health education and occupational home economics are among the areas of fastest growth. While postsecondary vocational programs tend to have more special population students than others, the concentration of special populations in vocational education is stable. Their proportion of all enrollments is not increasing, and that of other students is not decreasing. "Dumping" and stigmatization are not issues at the postsecondary level.

Some areas in postsecondary vocational education need attention or improvement. One is the preparation of vocational faculty. Their formal education is about the same as that of secondary vocational education teachers, and at both levels trade and industry faculty are the least likely to have college degrees. If the integration of academic and vocational curricula is to proceed, faculty members at both levels, and especially those in trade and industry, will need stronger academic backgrounds.

A second area that needs work is the development of tech-prep programs. While most community colleges are involved in tech-prep initiatives, many programs are just on paper or in very early stages of development. Without a strong commitment from postsecondary institutions, some tech-prep programs probably will not survive and others will remain rudimentary.

II. PERKINS QUESTIONS AND ISSUES

This part of the summary first addresses questions in the Perkins mandate related to program quality and program improvement; then it discusses equity issues related to special populations; and finally it examines funding and administrative issues specified in the legislation.

A. Program Quality

Conceptually, program quality can be assessed by examining the inputs, processes, and outcomes of vocational education. Among the inputs, the Perkins Act calls for inquiry into the preparation and qualifications of vocational teachers and their academic counterparts. Among the processes, the Perkins emphasis on the academic and vocational education of students suggests that an examination of classroom activities would be useful. The Act also requires an evaluation of the academic and employment outcomes of these programs.

Two qualifications should be noted. First, a comprehensive evaluation of the quality of vocational education is not required by the Act and is not attempted here. Nevertheless, responses to these Perkins questions and related issues do tell us a lot about program quality. Second, the focus on inputs, processes, and outcomes is not intended as a rigorous functional model of vocational education; it is merely a convenient way of organizing issues related to program quality.

Inputs — Preparation of Teachers in Vocational Education

1. *Teacher Qualifications.* One of the key inputs to education is the quality of the teaching force. Hence, the Perkins Act mandates an evaluation of the preparation and qualifications of vocational and academic teachers.[8] The Final Report will examine the preparation of vocational teachers to teach occupational skills. This report focuses on preparation to teach integrated courses with substantial academic content, as envisioned by the Act. How well are vocational and academic teachers prepared for these goals? (See Chapter 8.)

Both secondary and postsecondary vocational teachers have less formal education than academic teachers. While virtually all academic teachers and faculty members have at least a bachelor's degree, 12 percent of secondary vocational teachers and 15 percent of postsecondary occupational faculty do not. Further, studies of vocational teacher education in colleges and universities suggest insufficient preparation in academics, especially math and science.

While they have less formal education than academic teachers, secondary vocational teachers have much more occupational experience related to their subject areas. We infer that the same is true of postsecondary faculty, although data are lacking.

The tendency for vocational teachers to have less formal education and more occupational experience than academic teachers is most pronounced in trade and industrial education (T&I). Forty-five percent of secondary T&I teachers and 33 percent of those in postsecondary institutions have less than a bachelor's degree. Beginning with the 1917 Smith-Hughes Act, which provided the first federal assistance for vocational education, federal law and state certification policies have required less education for T&I teachers than for others, specifying related occupational experience instead. If secondary trade and industrial teachers had the same education as other vocational teachers, the educational differences between vocational and academic teachers at this level would be slight.

Judging from secondary vocational teachers' assessments of their ability to teach academic subjects, and from academic teachers' assessments of their ability to teach occupational subjects, they have enough knowledge in common to begin the process of integrating curricula. In the longer run, though, a great deal more preparation will be needed on both sides.

Processes — Classes in Secondary Vocational Education

2. *Coursework and Classes.* The growing emphasis on technology and new forms of organization in the workplace have increased the premium on conceptual skills in the labor market. The previous National Assessment of Vocational Education urged that vocational education be viewed in part as a vehicle for teaching academic skills and called for the integration of academic and vocational curricula.[9] Similarly, the Perkins Act emphasizes the importance of academic education in vocational programs and requires grant recipients to integrate their curricula.[10] With respect to these priorities, how extensive is the academic content of vocational classes? How extensive is the occupational content of academic classes? How much academics do vocational students typically receive outside of vocational education? What are the prerequisites and completion requirements of vocational programs? (See Chapter 9 and, for secondary student coursetaking, Chapter 4.)

In general, secondary vocational courses have some academic content, but not much. Only small proportions of vocational teachers report spending more than ten percent of class time on most academic subjects. For example, only 11 percent of all vocational teachers, and 20 percent of those in trade and industry, spend this minimum amount of time on problems in basic algebra. Academic teachers tend not to spend much time on occupational subjects, either.

Although research shows that homework helps improve (academic) performance, students in vocational classes are assigned only about 40 percent as much homework as those in academic classes.

Students classified as vocational on the basis of their coursetaking patterns earn fewer academic credits than those in the general track, although they are gaining, presumably because of increased academic requirements for graduation. Vocational students also earn fewer advanced academic credits, and their gains have been smaller for these courses.

Vocational classes involve more computer work than academic classes, much of it in business and office education with an emphasis on word processing. They are also more likely to emphasize the "workplace competencies" of the (Labor)

Secretary's Commission on Achieving Necessary Skills (SCANS), such as teamwork and understanding organizational systems, but less likely to emphasize the academic components of the SCANS "foundation skills." Yet a study of SCANS skills in the utilities industry finds that the foundation skills are significantly related to job performance, while most of the workplace competencies are not.

Vocational classes in secondary school tend not to have pre-requisites, a characteristic that maximizes access to them but reduces the chances of aligning vocational courses with relevant academic courses. Approximately one-third of the regular school districts have no completion requirements for vocational programs. One-half require a concentration of vocational courses in a particular occupational area for program completion. Research indicates that such concentration increases the earnings of those who find work related to their training and increases the chances of finding training-related work.

Outcomes of Vocational Education

3. ***Employment Outcomes.*** The Perkins Act calls for assessment of the academic and employment outcomes of vocational education.[11] Research on academic outcomes is still in process, and the results will be included in the Final Report. Here we concentrate on employment outcomes, which in many ways are the yardstick in evaluating vocational programs. If there is a positive relation between vocational coursetaking and employment status, level of occupation, and/or earnings, taking other factors into account, then the student's participation in vocational education, and the public's investment in it, will have been worthwhile. What evidence is there that vocational education pays off? (See Chapter 15.)

Economic returns to vocational educational education at the secondary and postsecondary levels are conditional on a number of factors. The following are associated with better employment and earnings outcomes:

> *Finding a job that matches a field of study.* Vocational students who do so tend to earn more money and have a lower incidence of unemployment over time than those who do not. Less than 40 percent of secondary graduates are able to find jobs that match their training. Postsecondary students do better, on average: Almost two-thirds of them find training-related employment.
>
> *Concentration of coursework in a particular field of study.* Students who concentrate their coursework in a vocational field earn more in training-related jobs, are more likely to find training-related jobs, and are less likely to be unemployed than those who do not.

Completion of a degree or certificate. Postsecondary vocational students who earn degrees or certificates do better than similar individuals with no postsecondary certification. There is also recent evidence that taking some postsecondary vocational courses yields better labor market outcomes than high school graduation alone.

Field of study. At the secondary level, those with training in business and health-related fields, mostly women, earn higher wages and experience less unemployment than those in other fields. At the postsecondary level, associate's degrees in health and technical fields tend to improve earnings.

Type of postsecondary institution. Community college students are more likely to be employed and to use their vocational training on the job than trainees from other types of postsecondary institutions.

Gender of the student. Economic outcomes for women with vocational training surpass those for men. Women are more likely than men to improve their wages and earnings with vocational training, more likely to find a match between training and employment, and more likely to benefit from completing a degree.

Vocational education for disabled students. Secondary students with disabilities who take vocational education are more likely to be employed than those who do not. Participating in work experience programs increases their likelihood of finding a job, and taking a coherent sequence of vocational courses increases their earnings. Disabled students with vocational training also tend to have better grades and attendance records than others and are slightly less likely to drop out of school.

Reducing dropout rates is often a goal of secondary vocational education. However, studies relating vocational coursetaking to dropout rates show mixed results, other than for disabled students. Most indicate no relation or a negative relation.

Because academics are assumed to be an important part of workforce preparation, a review of the literature relating academic skills to employment outcomes is being conducted. One study examined so far shows that the value of basic math skills is increasing as the labor market changes. This development may reflect a greater emphasis in the market on conceptual skills. In addition, the returns to basic math skills increase as individuals move further along in their careers. Mastery of these skills has a much greater impact on wages six years after graduation than two years after graduation.

B. Program Improvement and Education Reform

Evidence of America's declining economic competitiveness, relatively poor educational performance, and low earnings by high school graduates prompted broad movements for education reform in the 1980s. Initially, reform efforts focused on improving academics in elementary and secondary schools, but in the mid-1980s greater attention was also given to preparing young people for work, especially secondary students. Prominent among these reforms was an increased emphasis on performance standards and on three structural changes — the integration of academic and vocational curricula, the development of tech-prep programs, and the promotion of work experience programs — regarded as principal components of the school-to-work transition.

4. ***Effects of Education Reform.*** The Perkins Act calls for an assessment of the effects of education reform on vocational education.[12] Have the reform movements of the 1980s affected vocational education, and if so, how? (See Chapter 10.)

Education reform since 1980 has focused on secondary education and has occurred in two waves. The first emphasized increased academic work and higher academic standards. The second wave proceeded from a belief that the first did not adequately address the educational needs of students, especially non-college-bound students in high school, and put forth a number of proposals for restructuring education. Among these proposals, the school-to-work transition reforms are of primary interest here.

Both first- and second-wave reforms are incorporated in the Perkins Act. The Perkins requirement that states develop performance standards and measures is a part of the first wave, extended to vocational education. The Perkins emphasis on integration, tech prep, and work experience programs is part of the second wave.

The impact of first-wave academic reforms on secondary vocational enrollments has been a much debated issue. It is the view of most vocational educators that increased academic requirements for high school graduation, one of the key elements of first-wave reform, have reduced vocational enrollments by leaving students less time for electives, such as courses in vocational education.

Our statistical analyses do not support this view. According to survey reports, between 1987 and 1992 districts with higher graduation requirements showed no greater decline in vocational enrollments than other districts. In our community case studies, on the other hand, it was the nearly unanimous opinion of respondents asked about this issue that academic reforms had reduced vocational enrollments. We think it would be a mistake to dismiss the informed opinion of so many vocational educators, and we regard the question as unresolved.

For whatever reason, though, there has been a broad shift away from vocational education and toward academics since the early 1980s. An 11 percent decline in secondary vocational credits earned took place between 1982 and 1990. In the same period, academic coursetaking, especially in math and science, increased.

In the midst of this shift, there is evidence that some second-wave reform efforts are associated with **increasing** vocational enrollments. Districts that take more steps to integrate their curricula and districts that have more state support for integration than others also tend to have increasing enrollments. Districts that have added vocational student organizations (VSOs) and those that have added career exploration courses are also more likely than others to experience increases in vocational enrollments. We do not know that these reforms or improvements cause an increase in enrollments, only that they are associated with it.

More broadly, second-wave reforms are bringing new energy to efforts to prepare young people for the workforce. At the federal level, the Perkins Act and the currently proposed School-to-Work Opportunities Act focus on improving the preparation of students for occupations. At the same time, states such as Oregon, Wisconsin, South Carolina, and a number of others are, on their own initiative, restructuring their curricula to provide better occupational education.

5. *Changes at the Local Level.* The Perkins mandate calls for an assessment of the effects of the Act on local practices, including the capacity of local vocational education systems to address the priorities of the Act.[13] Is there evidence that Perkins is changing vocational education at the local level? (See Chapters 3, 4, 10, 11, 12, and 13.)

While definitive conclusions are not possible, the data suggest that the Perkins Act does have an impact on local programs. School districts receiving Perkins basic grant funds a) provide more services for special populations; b) have taken more steps to integrate their curricula; and c) have taken more steps to develop tech-prep programs than their unfunded counterparts. In multivariate analyses, school districts that report having been influenced by Perkins are more active in integrating their curricula and developing tech-prep programs than others.

The evidence also suggests that support for Perkins reforms by state agencies can affect local implementation. Only a minority of districts report strong state support for Perkins reforms, but greater state activism is associated with more local reform. For example, state support for integration and performance standards is positively related to district efforts in these areas, controlling for other factors.

Relationships between Perkins funding and reforms such as integration and tech prep are evident in postsecondary institutions as well, but are less pronounced than at the secondary level. Postsecondary state agencies also seem to have less effect on local programs than do their secondary counterparts.

6. ***Performance Standards and Measures.*** The Perkins requirement that states develop performance standards and measures for vocational education, and that local grant recipients implement them, is an important first-wave reform. The Act calls for an evaluation of the effect of performance standards on the delivery of vocational education services.[14] While it is too early for these efforts to have had much effect on local programs, we can ask how well states are doing in developing the required standards and measures. (See Chapter 11, also Chapter 3.)

State agencies have given a high priority to developing performance standards and measures. Most states go beyond the requirements of the Perkins Act, developing fuller arrays of performance measures than required and applying them to all vocational programs, not just those receiving Perkins funds. At the time of our surveys, most of the new systems of performance assessment were not yet functioning at the local level, and we do not know how or to what extent they will be used to improve vocational programs.

One area in which the systems seem weak is in measuring occupational skills at the secondary level. While commercial skill tests are available, and the military has the Armed Services Vocational Aptitude Battery (ASVAB), there are no equivalents of the National Assessment of Educational Progress (NAEP) or the Scholastic Aptitude Tests (SATs) for occupational/technical skills. Such standardized tests would give educators and students a better idea of the range and level of skills provided by vocational education.

7. ***Academic/Vocational Integration.*** Integration, tech-prep, and work experience programs are prominent in second-wave restructuring reforms and are key elements in the "school-to-work transition," which the Perkins Act calls upon the National Assessment to describe and evaluate.[15] We begin with the integration of academic and vocational curricula, a required use of Perkins funds.[16] How extensive is it and what evidence is there of its effectiveness? (See Chapter 12.)

At the secondary level, most districts and schools report taking some specific steps to integrate their curricula, such as holding planning meetings, integrating across academic and vocational courses, and providing in-service training for teachers. Districts receiving Perkins basic grant funds are more likely than others to report taking such steps, and vocational districts are more likely than regular districts to do so.

However, these efforts are not well developed. As we have seen, very little academics is taught in vocational classes, and very little occupational subject matter is taught in academic classes. Further, there is evidence that teachers lack sufficient time for integration activities. For example, though a majority of schools say that some of their teachers are working together to develop integrated courses, only one-fourth of those reporting such cooperation have set a regular schedule for doing so.

The division between the secondary academic and vocational systems is still pronounced. Academic teachers are more likely to coordinate courses among themselves than with vocational teachers, and the latter also tend to coordinate among themselves. Indeed, there is evidence of resistance to integration because it would require changing long-established assumptions and patterns of behavior. The resistance seems to be stronger among academic teachers and administrators but is by no means absent on the vocational side. Moreover, special population students are becoming more concentrated in vocational courses (see item #9 below), a trend that may tend to increase the separation of the two spheres.

On the whole, district efforts to integrate seem to be small accommodative responses to the Perkins requirements — that is, finding ways to fit some integration into the existing curricular structure. Typically, these efforts might involve incorporating more academic material into a few vocational courses or offering applied academics courses based on commercially available materials. To what extent the resistance to integration will dissipate, and to what extent the small steps to integrate will develop into deeper, more systemic integration are still unclear. We think the prospects for systemic change are better in the states that undertake broad-based reforms to improve the workforce preparation of students.

At the postsecondary level, the integration of curricula looks somewhat stronger and probably predates the 1990 Perkins Act. Even though state secondary agencies are more active in promoting integration, and secondary districts provide more teacher training in this area, postsecondary institutions show greater strength in coordinating across curricula. They are more likely to use cross-curriculum materials and to provide interdisciplinary courses.
Almost three-fourths of postsecondary institutions have developed applied academics courses such as technical math and business English. They are almost twice as likely as secondary schools to provide "tandem" academic and vocational courses.

Further, the great majority of postsecondary institutions (83 percent) require general education competencies for vocational students. Demonstrating these competencies usually involves passing a prerequisite academic course or taking a co-requisite academic course along with a vocational course. In somewhat over half of the postsecondary institutions (58 percent), vocational faculty are involved in establishing general education competencies.

It is still too early to assess the effectiveness of integrated education in terms of academic and employment outcomes. However, there is evidence that "contextualized learning," that is, education in a context that enables students to relate schoolwork to the world outside of school, is a more effective pedagogical approach than traditional education, with its emphasis on knowledge for its own sake. There is also evidence from the military that a contextual approach to training results in better job performance than other methods, and some suggestive (but inconclusive) evidence that the military's use of a contextual approach to adult literacy training is relatively effective.

On the other hand, there is not much systematic evidence that integrated academic/vocational education in schools is effective, in part because not much systematic research has been conducted. The best research on the subject has focused on career magnet schools and career academies, considered forms of integration because their academic and vocational curricula are related to each other by a common goal — preparing students for careers in a particular industry.

In one evaluation of New York career magnet schools and programs, a cohort of student applicants randomly selected into the magnets outperformed other applicants who were not selected. Most of these effects faded in the second year of the study, although career magnet students were still less likely than others to drop out of school. Similarly, research on students in California career academies found that they outperformed comparison students in the first year of the study, but by the third year, they no longer did so. Nevertheless, first-year effects such as fewer failed courses were not lost. The employment outcomes of academy graduates were no better than those of comparison students, however.

8. *Tech-Prep Programs.* Tech prep is another Wave II reform, a key element in the Perkins reforms, and a component of the school-to-work transition. The Perkins Act calls for an assessment of the "articulation between secondary and postsecondary programs," which is the cornerstone of tech prep. How extensive and how well developed are tech-prep programs? (See Chapter 13.)

As with integration, tech-prep efforts at present tend to be widespread but not well developed. Hundreds of tech-prep initiatives are reported by postsecondary institutions, and thousands by school districts. Most are still in the earliest stages of planning and implementation. Most have no students yet; those with students tend to be small, and the definition of tech-prep students is often hazy. Articulation between secondary and postsecondary curricula is usually on a course-by-course basis, rather than a program basis.

As with integration, a key question is how much these efforts represent minor adaptations of existing curricula and how much they represent the small beginnings of larger, more systemic reforms. A few well-established tech-prep programs have gone beyond simple course articulation, and in the

9 percent of tech-prep districts reporting transition rates in a survey, a median 47 percent of secondary tech-prep students enter affiliated postsecondary institutions.

Perkins Title III Tech-Prep grants are usually awarded competitively by states. Nationwide, 42 percent of community colleges received Tech-Prep funds in 1991–92, compared to 9 percent of regular districts and 19 percent of vocational districts. Title III grants are more likely to go to districts that already have tech-prep initiatives than to those that do not, and awards are largely independent of the proportion of special population students in a district. Tech-prep programs in the case study sites are being developed primarily for "the average student." Nevertheless, most districts are making provisions for special populations in tech-prep.

9. *School-to-Work Transition.* A third element in the school-to-work transition is work experience programs such as cooperative education and youth apprenticeship programs. As a final step in addressing the Perkins mandate to assess the school-to-work transition,[17] we examine these and related ways in which work may contribute to education and workforce preparation. How extensive are these programs, and what evidence is there of their effectiveness? (See Chapter 14.)

Cooperative education is the oldest and most widespread of these work experience programs. Most secondary districts and postsecondary institutions have co-op programs, and over 400,000 secondary students participate in them. Systematic research indicates that although students generally like co-op programs, evidence of positive academic or occupational outcomes is generally conflicting and inconclusive. (However, it does seem that disabled students derive employment benefits from work experience programs in general.)

New youth apprenticeship programs, in which students receive their occupational skill training on the job under the supervision of mentors, are generally small and few in number. They have not been rigorously evaluated, so there is no systematic information on their effectiveness. Some preliminary research currently being conducted on apprenticeship programs will be included in the Final Report.

Many students work while in high school, and they may derive some benefits from doing so, up to a point. Working up to 15–20 hours a week does not seem to depress grades and is positively associated with later college attendance. Self-selection must be considered in interpreting these data, however. For example, students may be working in high school in order to earn money for college.

In general, the major types of work experience programs need rigorous evaluation of outcomes.

C. Equity in Vocational Education

10. ***Access for Special Populations.*** As part of its effort to help special population students, the Perkins Act requires states to provide assurances that these students have equal access to vocational education and that localities ensure their full participation in programs improved with Perkins money.[18] As part of its mandate to the National Assessment of Vocational Education, the Act also calls for an examination of the "participation in vocational education programs, including, in particular, the access of . . . special populations to high-quality vocational education programs."[19] The previous National Assessment identified area vocational schools as among the principal providers of high-quality secondary vocational education and found that special population students had less access to them than students in general. Has this access pattern changed? More broadly, what are the patterns of access and participation for special population students at the secondary and postsecondary levels? (See Chapters 4 and 5.)

At the secondary level, access of special population students to area vocational schools (AVSs) is still more limited than that of other students, because special populations are located in central cities and rural areas out of proportion to their numbers, while most area vocational schools are in suburban areas. However, two factors tend to offset this limitation. First, in many large cities, vocational high schools, including career magnets, provide access to special population students, among others. Second, comprehensive high schools with access to AVSs send a disproportionate share of special population students to them. Area vocational schools have higher concentrations of special population students than comprehensive high schools.

In the context of a general decline in secondary vocational enrollments, special population students are over-represented in vocational education. For example, in 1992 the 34 percent of all high school graduates who are members of special population groups earned 43 percent of all vocational credits. Disabled and disadvantaged students' share of vocational credits has increased since 1982, while that of higher achieving students has decreased. In some districts, vocational education programs are becoming the province of the hard-to-educate.

Within the vocational curriculum, certain program areas — especially occupational home economics and trade and industry — have relatively high proportions of special population students. Vocational program areas are also strongly differentiated by gender, although this differentiation appears to be diminishing slowly in at least some vocational fields.

Access to postsecondary education in general is largely a function of student preparation and affordability. While student preparation has not changed much in the last decade, affordability has decreased. Between 1980 and 1990, four-year tuition costs increased 37 percent in real dollars, while costs at two-year institutions, mainly community colleges, increased 11 percent.

This differential seems to have contributed to greater enrollment increases in two-year institutions, although enrollments are growing at both levels, in spite of increasing costs. In public two-year institutions, which provide the bulk of postsecondary vocational education, both academic and vocational enrollments, including those of disadvantaged students, are increasing.

As at the secondary level, postsecondary vocational programs tend to have more special population students than other programs. However, the greatest differences are between institutions, not within them. Proprietary schools and public technical institutes, which are exclusively vocational, have the highest proportions of special population students. Occupational programs in community colleges have lower proportions, those in other postsecondary institutions, lower still. Within community colleges, special populations students are as likely to be found outside of vocational programs as in them.

In contrast to the pattern in secondary districts, special population enrollments in postsecondary vocational education have remained a constant percentage of all vocational enrollments; the more able students are not leaving vocational education. As at the secondary level, vocational programs have long been strongly differentiated by gender, and at this level they remain so.

11. ***Targeting Special Populations.*** The 1990 Perkins Act eliminated categorical funds set aside for disabled, disadvantaged, and LEP students in the 1984 Act, while continuing those for sex equity, single parent, and corrections programs.[20] The elimination of the set-asides was intended to give localities more flexibility to improve their programs. At the same time, to help assure that the needs of special population students would continue to be met, the Act's within-state allocation formulas were designed to target funds on districts and postsecondary institutions with large shares of a state's special population students.[21] Did such recipients tend to get larger grants than others? (See Chapters 2 and 7.)

Secondary districts and postsecondary institutions with more special population students, and higher proportions of these students, did receive larger basic grants than others in FY92. Perkins basic grant funds were already targeted on recipients with large numbers of special populations in FY91, and the targeting increased after the new Act. These patterns are stronger at the secondary than at the postsecondary level.

Sex equity and single parent grants were concentrated in fewer sites under the new Act. There was no relation between the allocation of single-parent grants and proportions of economically disadvantaged students in sites receiving them, even though the Perkins Act requires that "individuals with the greatest financial need" be given priority for these funds.

12. ***Impact on Services.*** The elimination of set-asides for special population students raised concern that services for these students might be cut back. To prevent this from happening, the 1990 Perkins Act requires basic grant recipients to address the needs of special population students and to provide assurances that they are doing so.[22] The Act also calls for an assessment of its impact on services for special populations.[23] Have these services been reduced under the new legislation? (See Chapters 6 and 7.)

On average, services for special population students were not reduced under the new Act. Services at both funded and unfunded sites remained about the same between 1990–91 and 1991–92. Funded sites had larger increases in services for limited English proficient students at the secondary level and for disadvantaged students at the postsecondary level than did unfunded sites. In postsecondary institutions, LEP services may be in short supply as increasing numbers of immigrants are seeking to enter community colleges.

13. ***Participation and Monitoring.*** To help ensure that the needs of special population students are addressed, the Perkins Act requires that states monitor the access of special populations to vocational education and include representatives of special populations in reviewing local applications for Perkins funds. To what extent have special population representatives been involved in these activities? (See Chapter 6.)

Almost all state agencies, both secondary and postsecondary, monitor participation of special population students in vocational education, although the General Accounting Office has expressed reservations about the extent and kind of data collected for monitoring. Participation by special population representatives in planning and implementation decisions is widespread, but not universal. There is room for improvement in areas such as the review of local plans at the state level.

D. Funding and Administration Issues

14. ***Secondary/Postsecondary Funding.*** Perkins Title II basic grants are awarded to the states by the federal government on a formula basis. Each state then decides how the basic grant money will be divided between the secondary and postsecondary sectors. The secondary/postsecondary split has long been of interest to federal policymakers. What is the split, and how has it changed under the new Perkins Act? (See Chapter 2.)

State administrative records indicate that the postsecondary share of Title II basic grant funds declined from 40.2 percent in FY91 to 38.1 percent in FY92, a difference of 2.1 percentage points. When all Perkins funds are considered, including Title III Tech Prep monies, the postsecondary share declined somewhat less, from 41.8 percent to 40.2 percent, a 1.6 percentage point difference.[24] In general, there has been little change in the overall share of Perkins funds flowing to postsecondary education over the past six years.

The combined effects of the federal formula for allocating funds to the states and the secondary/postsecondary split at the state level are powerful, and they can result in marked differences in allocations to local districts with similar educational needs. For example, Oakland, California, a city with a 29.1 percent poverty rate for children aged 5–17, received $12.50 per student in grades 9–12 in FY92. Philadelphia, Pennsylvania, with a 29.2 percent poverty rate among children of the same age, received $20.97 per student.

15. ***Concentrating Funds.*** The last National Assessment of Vocational Education found that Perkins basic grants allocated by states to secondary districts under the 1984 Act were so small and widely distributed that it was doubtful they could have much impact on vocational education programs. (The median grant to regular school districts was $7900.) (See Chapter 2.)

The 1990 Perkins Act attempted to concentrate and target funds by providing formulas for the allocation of basic grants; by setting $15,000 as the minimum size of grants to secondary recipients and $50,000, to postsecondary institutions; and by shifting funds from state administration to localities. Secondary districts that could not qualify for the minimum were permitted to join together in consortia that could qualify. What were the allocation patterns under the 1990 Perkins Act, and how did they change from those under the last year of the 1984 Act? Were Perkins monies concentrated in bigger grants to fewer recipients? (See Chapter 3.)

At the secondary level, the findings are complicated by the role of consortia. While fewer basic grants were awarded under the new Act, more districts now "participate" in Perkins funding, because many districts are included in consortia. Data from state funding records indicate that the mean basic grant increased from $44,516 in FY91 to $99,616 in FY92, while the number of grants decreased from 7,625 to 3,958. Of the 3,958 awards, 2,825 were to individual school districts and 1,133 were to consortia. The consortia included 8,170 districts.

If these data are correct, almost all districts with secondary vocational programs (10,995 out of 11,274) participate in Perkins funding, either directly or through consortia. Some states are using consortia as the primary mechanism for distributing Perkins funds: In 16 of 43 states for which data are available, more than 90 percent of the districts are in consortia.

While these findings seem to indicate a great increase in the number of districts participating in Perkins basic grant funds (from 7,625 to 10,995), the actual number of districts using grant money is lower than the data suggest. For one thing, the 1990 Act provides that area vocational schools can receive basic grant funds only through consortia or cooperative agreements with regular districts,[25] and some district recipients simply pass the money through to the AVSs. Other factors probably affect the actual receipt and use of Perkins funds as well. Further research on the allocation of funds within consortia is being conducted, and the results will be included in the Final Report.

At the postsecondary level, the findings are more straightforward. The mean basic grant increased from $178,234 in FY91 to $228,627 in FY92, and the number of awards decreased from 1,289 to 1,032. Since there are no consortia at the postsecondary level, there was increased concentration of funds under the new Act.

The state data also reveal that grants to secondary districts increased in large and middle-sized cities relative to other areas, and grants to postsecondary institutions increased in large cities relative to other areas.

16. ***Administrative Changes.*** To give localities more resources and flexibility to build their programs, the Perkins Act reduced the proportion of funds for the administration of state vocational education programs, activities, and plans and increased the localities' share.[26] The Act calls for an assessment of the effects of Perkins on state administration and the capacity of states to address the priorities in the Act.[27] What effect have these legislative changes had on state administration and activities? (See Chapter 3.)

State secondary and postsecondary vocational agencies received about 28 percent less Perkins money for administration in 1991–92 than in 1990–91. In the same period, state secondary agencies lost a median 15 percent of their staff, though postsecondary agencies did not lose staff. We cannot tell whether or to what extent the Perkins reductions contributed to the staff losses in secondary agencies.

However, it is clear that both secondary and postsecondary agencies changed their work priorities in this period, apparently in response to the Perkins Act. Most notably, both gave a new, high priority to the development of performance standards and measures, one of the requirements of the Act. They also substantially increased the priority of activities designed to help special population students. Curriculum development and state leadership activities received less attention, relative to other activities.

E. Other Related Issues

17. ***Supply of Teachers***. College and university programs to train vocational teachers are being cut back under budgetary and other pressures. These reductions have led to predictions that vocational teachers will be in short supply. The Perkins Act calls for an assessment of the "shortages" of vocational education teachers.[28] (See Chapter 8.)

Analysis of data from secondary schools indicates that there is no particular shortage of vocational teachers. In 1990–91, about 5 percent of secondary schools said they had hard-to-fill positions for vocational teachers — more than for English teachers, about the same as for math and science teachers, less than for foreign language and special education teachers.

More generally, the numbers of secondary vocational teachers declined 9 percent between 1987 and 1990, paralleling the decline in vocational student enrollments, while the numbers of other teachers increased 7 percent. Information on the supply of and demand for teachers in specific vocational program areas and for postsecondary vocational teachers is being sought.

18. ***"All Aspects of the Industry."*** Local recipients of Perkins basic grant funds are required to use the funds to provide vocational education in programs that "train adults and students for all aspects of the occupation, in which job openings are projected or available."[29] Other parts of the legislation reinforce the Act's emphasis on what is commonly referred to as training in "all aspects of the industry." How much emphasis are states and localities giving to training in all aspects of the industry? (See Chapter 12.)

Little attention is being given to training of this kind. In 1991–92 no more than 25 percent of state secondary agencies and 15 percent of state postsecondary agencies had taken any one of six listed steps to promote instruction in all aspects of the industry. At the local level, state support for an "all aspects" agenda is weak, and only 4 percent of regular districts and 5 percent of postsecondary institutions receiving basic grants are using Perkins funds to develop "all aspects" curricula.

A few findings are more positive than those above. First, about one-fourth of secondary schools already provide some instruction in subjects related to all (or many) aspects of an industry, such as health, safety, and environmental issues. Second, 27 percent of regular districts and 35 percent of postsecondary institutions say they are including "all aspects" instruction in their tech-prep programs. Third, almost three-fifths of state secondary agencies said they planned to take at least some action to promote instruction in all aspects of the industry in 1992–93. We will revisit this issue in the Final Report, using data from follow-up surveys conducted in Spring 1993.

One problem with these provisions of the Perkins Act is the lack of an operational definition of "all aspects of an industry" (or occupation). Efforts (unrelated to this assessment) to develop a workable definition and illustrate practical applications of the concept are currently under way.

ENDNOTES

1 The introduction provides a context for the summary of findings in the Interim Report. It does not itself summarize findings of the study.

2 National Center on Education and the Economy (1990). *America's Choice: High Skills or Low Wages*. Rochester, NY: Author.

3 National Center on Education and the Economy and the Economy, op. cit.

4 Osterman, P. (1993), *How Common is Workplace Transformation and How Can We Explain Who Adopts It?* Cambridge, MA: Massachusetts Institute of Technology.

5 Data from U.S. Department of Commerce, U.S. Bureau of the Census, Current Population Survey, March 1991.

6 The National Commission on Excellence in Education (1983). *A Nation at Risk: The Imperative for Educational Reform.* Washington, DC: U.S. Department of Education.

7 Section 403 (b) (3).

8 John Wirt and others (1989), *National Assessment of Vocational Education, Final Report, Volume I, Summary of Findings and Recommendations,* Washington, DC, U.S. Department of Education.

9 Sections 113 (a) (3) (B) and 235 (b) (1) (a).

10 Section 403 (b) (5).

11 Section 403 (b) (5) (A).

12 Section 403 (b) (1).

13 Section 403 (b) (7).

14 Section 403 (b) (5) (C).

15 Section 235 (c) (1) (B). Section 403 (b) (5) (B) requires the National Assessment of Vocational Education to examine the "extent and success of integration of academic and vocational curricula."

16 Section 403 (b) (5) (C).

17 Sections 118 (a) (1); 118 (a) (2); and 235 (a).

18 Section 403 (b) (4).

19 See Section 102. Special populations include educationally and economically disadvantaged students, disabled students, those with limited English proficiency, students in vocational programs non-traditional for their sex, and individuals in correctional institutions. The

set-asides described in the text as being for "single parent" programs are for programs for "single parents, displaced homemakers, and single pregnant women." Vocational programs for individuals in correctional institutions will be examined in the Final Report to Congress.

[20] Sections 231 (a) (1) and 231 (a) (2).

[21] Sections 235 (c) (1) (C) and 240 (5).

[22] Sections 403 (b) (2) and 403 (b) (8).

[23] Since these data are from a census of state records, they are not subject to survey sampling error, although other kinds of error no doubt exist.

[24] Section 231 (d).

[25] Sections 102 (a) (3), 102 (a) (4), and 102 (a) (1).

[26] Section 403 (b) (1).

[27] Section 403 (b) (3).

[28] Section 235 (c) (2) (L).

[29] Sections 118 (b) and 118 (c).

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THE INTERIM REPORT

CHAPTER 1

INTRODUCTION

The National Assessment of Vocational Education is a three-year study that describes and evaluates many of the most important aspects of the nation's secondary and postsecondary vocational education systems. This Interim Report presents the findings of the National Assessment as of January 1, 1994. It is a preliminary report, reflecting data available as of October, 1993 and our tentative conclusions based on those data. Additional research findings obtained through February, 1994 will update these findings in a two-volume Final Report. Because additional data (which could conceivably change our conclusions) remain to be incorporated, our policy recommendations will be included only in the Final Report. That report will be published at the conclusion of the Assessment, on July 1, 1994.

This introduction reviews the mandate for the National Assessment of Vocational Education, and presents an overview of its legislative authority, the 1990 Perkins Act. We then review the history of federal legislation leading up to the current assessment; discuss the issues addressed in this report; and review the assessment's major data sources. The chapter concludes with an outline of the remainder of the report.

THE PERKINS MANDATE

As part of its broader mission to improve vocational education in secondary and postsecondary schools, the Carl D. Perkins Vocational Education and Applied Technology Education Act of 1990 calls upon the U.S. Department of Education's Office of Educational Research and Improvement (OERI) to conduct a national assessment of vocational education programs. The basic purpose of this assessment is to provide the Congress with information on the current condition of vocational education and on the effectiveness of the 1990 Perkins Act in meeting federal goals. The Congress will use this information (in conjunction with other sources of information) in its deliberations on the reauthorization of the Perkins Act in 1995.

Section 403 of the Perkins Act mandates that the National Assessment of Vocational Education examine ten specific topics concerning the status of vocational education and the implementation and effects of the 1990 Perkins Act. These topics are:

- the effect of the Perkins Act on state and tribal administration of vocational education programs and local education practices, including states' and localities' ability to address the priorities identified in the Act;

- federal, state and local expenditures for vocational education, including the impact of Perkins Act allocation requirements on the delivery of services;

- preparation, qualifications, and shortages of vocational education teachers;

- participation in vocational education, including the access of special population students[1] to quality vocational education programs and the effects of new funding flexibility on the delivery of services to these students;

- academic and employment outcomes of vocational education, including the effect of education reform on vocational education; the integration of academic and vocational curricula; the school-to-work transition; and the degree to which vocational training is relevant to subsequent employment;

- employer involvement in and satisfaction with vocational education programs;

- the effect of performance standards and other accountability measures on the delivery of vocational education services;

- the effect of federal requirements concerning criteria for services to special populations, participatory planning, and articulation between secondary and postsecondary programs;

- coordination of Perkins Act services with services provided under other federal adult education and training programs; and

- the degree to which minority students are involved in vocational student organizations (VSOs).

This Interim Report includes findings on all of these issues for which studies have been completed. Major issues not covered include vocational education in Perkins-funded tribal institutions and correctional facilities; student participation in VSOs; employer satisfaction with and involvement in vocational education; the coordination of Perkins Act services with other training programs; and the academic outcomes of vocational education. The Final Report will address all issues in the mandate, including those not covered in the Interim Report.

The National Assessment also is required to submit to Congress a study on the distribution of federal vocational education funds to the states, including the impact of the current interstate funding formula, an exploration of alternative funding formulas, and recommendations on how to best target funds to the states. This study is being published as a separate report.[2]

The design of the National Assessment is determined by this Congressional mandate and, more broadly, by the goals and additional provisions of the 1990 Perkins Act.

OVERVIEW OF THE 1990 PERKINS ACT

Since 1917, when the Congress passed the first federal legislation supporting vocational education, the underlying goal of federal efforts in this area has been to guarantee that the education system provides the skilled labor force needed for a technical and competitive economy. In the 1990 Perkins Act, this goal is shaped by the recognition of major changes in international economics, the organization of work, and the skills required of workers:

> It is the purpose of this Act to make the United States more competitive in the world economy by developing more fully the academic and occupational skills of all segments of the population. This purpose will principally be achieved through concentrating resources on improving educational programs leading to academic and occupational skill competencies needed to work in a technologically advanced society.

This Perkins Act goal parallels other recent reports suggesting that improved competitiveness in a world economy may no longer be achievable by working longer or harder, but only by working "smarter." Three factors are generally considered to contribute to this change. First, an increasingly global economy (spurred in large part by technological advances in communications and information systems) is motivating industries to move unskilled jobs to countries with low-wage labor pools. Second, technology continues to advance at an escalating rate, and to infiltrate formerly "low-tech" occupations. For example, auto mechanics must now be adept at operating computerized diagnostic equipment; drafters work almost exclusively with computerized design software; and health technologies are expanding rapidly. Third, there are also indications that the structure of the workplace is changing, with more customized production and increased responsibility, teamwork, and problem-solving on the front line. This "high performance workplace" requires a broader, more intensive use of the skills and intellect of the workforce.

These changes suggest that labor market competition increasingly will be for skilled jobs. To maintain these jobs, the American labor force must prove it has the skill advantage that justifies higher wages. In short, American workers will need more highly developed technical skills and stronger conceptual skills if they are to retain and attract the jobs that will be in greatest demand in the new international economy.

To help meet these new skill needs, the Perkins Act encourages broad-based reforms in the way American education prepares young people for work. It requires states to develop new performance standards for vocational education. It promotes new programmatic initiatives to facilitate the school-to-work transition — the integration of academic and vocational curricula, "2+2" tech-prep programs linking secondary and postsecondary education, and work experience programs linking education to the labor market.

The Perkins Act also recognizes that a historic equity issue — the underdevelopment of the skills and talents of people often discriminated against on the basis of race, gender, or disability — is also a major issue of efficiency in international economic competition. Lack of adequate education for large sectors of the population not only reduces productivity, it increases social costs. To address this problem, the Perkins Act stresses the participation of special population students in vocational education and the access to quality vocational education programs. This emphasis follows a long tradition of federal focus on equity in education (as well as in other areas, such as employment and housing).

In fact, both program improvement and equal access are long-standing themes that evolved through earlier versions of the current Perkins Act. A review of this legislative history provides a useful context for understanding the 1990 Perkins Act.

LEGISLATIVE HISTORY[3]

Federal support for vocational education began with the Smith-Hughes Act of 1917 and has continued since then, although with major changes in purpose and structure.

The original Act reflected the view of reformers who believed that youth should be prepared for entry-level jobs by learning specific occupational skills in separate vocational schools. This brand of vocationalism had its critics, including John Dewey, who believed that such specific skill training was unnecessarily narrow and that a dual school system would create invidious distinctions among youth and undermine democracy.[4] Dewey's view of occupational education as part of a broader and richer curriculum in secondary schools was rejected by the Smith-Hughes Act, which firmly supported the notion of a separate vocational education system. For example, the Smith-Hughes Act helped fund separate vocational schools, and supported courses offered by these schools. It called for specific skill training, focused on entry-level skills, and helped establish separate state boards for vocational education.

The Smith-Hughes Act and its successors until 1963 were largely designed to expand these separate vocational education programs, in an effort to retain more students in secondary education,[5] and to provide trained workers for a growing number of semi-skilled occupations. These acts focused on basic support, providing funds for teachers and teacher training, and encouraging state support for vocational education through extensive funds matching requirements.

By the 1960s, the vocational education system had been firmly established, and the Congress recognized the need for a new focus. As a result, the 1963 Vocational Education Act, while still supporting the "separate system" approach by funding the construction of area vocational schools, also broadened the definition of vocational education to include occupational programs in comprehensive high schools, such as business and commerce. The act also broadened its goals to include the **improvement** of vocational education programs and the provision of programs and services for disadvantaged and disabled students.

Faced with initial evidence that localities were not responding to the new focus on improving programs and serving special needs students, the 1968 Amendments to the Vocational Education Act backed each goal with specific funding. This change set the stage for what has become the distinguishing feature of all such legislation since 1968 — the manner in which it seeks a compromise between the demands for improved vocational program quality and for increased vocational education opportunities for students with special needs.

Separate funds "set aside" for disabled and disadvantaged students seemed an effective strategy, as it "resulted in more funds expended on these groups and in increased enrollments."[6] Since there are few other sources of federal assistance for secondary special needs students (other than disabled students),[7] it is not surprising that other "special populations" were added to federal vocational education legislation over time. In 1974, the needs of limited English proficient (LEP) students were addressed through provisions for bilingual vocational training; funds for Native American students were also added. In 1976, LEP students were made eligible for part of the disadvantaged set-aside, and provisions to eliminate sex bias and sex stereotyping in vocational education were added.

Finally, the 1984 Carl D. Perkins Vocational Education Act added set-asides for corrections education and for single parents; an entitlement provision that requires localities receiving disabled and disadvantaged set-aside funds to provide supplementary services for these students; and an equal access provision that requires localities to ensure full access for disabled and disadvantaged students in recruitment, enrollment, and placement.

At this point, the Act's dual purpose was not only still intact, it was now the defining feature of the legislation. Federal law had clearly developed the legislative equivalent of a split personality: One part of a state's basic grant was designated for program improvement, and the second part for specific services for disabled, disadvantaged, LEP, and adult students. As a result, local vocational educators often discussed Perkins funding in terms of "our money" (program improvement funds) and "their money" (set-aside funds).[8] Because of this split in funds (as well as their wide dispersal) the previous National Assessment of Vocational Education (NAVE) concluded that program improvement efforts were not occurring where they were most needed — in schools serving the greatest number of special needs students.

The 1990 Perkins Act incorporates changes to address this problem: The disabled, disadvantaged, and adult set-aside funds were merged with program improvement funds, and these "basic grant" funds are now targeted to localities that serve the highest concentrations of special population students. To ensure that basic rights and services for special population students secured through previous legislation are not lost, the equal access assurances were expanded.

The previous National Assessment also expressed concerns with the overall quality of vocational education programs, particularly their ability to contribute to students' academic skill development. To encourage schools to improve their vocational programs, the 1990 Act requires states to develop performance standards, and localities receiving funds to integrate academic and vocational instruction, provide "all aspects of the industry" instruction, and develop "coherent sequences of courses." In addition, the Act provides funds for consortia of secondary and postsecondary schools to develop tech-prep programs, linking secondary vocational education programs to two-year postsecondary technical programs.

ISSUES ADDRESSED IN THIS REPORT

Based on our Congressional mandate and the new provisions of the 1990 Perkins Act, this report encompasses five major areas of inquiry. The first concerns the implementation of the Perkins Act, including the distribution of funds and the administration of the Act at the state level. The second deals with student participation in vocational education, and the third with vocational teachers and classes. The fourth concerns education reform and program improvement, and the fifth addresses the effectiveness of vocational education.

Perkins Funding and Administration

The Perkins Act is designed to achieve certain federal goals related to vocational program access and quality. Rules on the distribution, allocation, and uses of funds are the primary method used to reach these goals. A basic issue for the

National Assessment to address is the extent to which these funding criteria work in the manner intended.

The Concentration and Targeting of Funds

The 1984 Perkins Act divided local basic grant funds into program improvement funds and numerous restricted use set-asides, with each pool of funds allocated by separate criteria. The NAVE found that this resulted in funds being scattered and fragmented; few sites received enough to support meaningful change, and funds were not reaching those students most in need of federal assistance. To improve both grant size and targeting, the 1990 Perkins Act merged the set-asides with program improvement funds and required that these merged funds be allocated based on a formula that heavily weights the concentration of special population students at each site. Minimum grant sizes were also established to ensure that grants are of sufficient size to have an impact.

These changes lead to the following questions:

- Are Perkins funds more concentrated under the new Act?
- Are funds better targeted on special population students?

Both of these issues are addressed in Chapter 2, "Patterns of Perkins Funds Allocations," which examines the distribution of funds from states to localities.

The Perkins Act and State Administration

In response to concern that some states were not using their allotment of Perkins funds appropriately and that localities needed more resources and flexibility to implement the Perkins Act, Congress reduced states' administrative allotment in the 1990 Act, but also added new responsibilities. Since states are important agents in vocational education, there is some concern about the effects of this change:

- Has the reduction of Perkins funds for state administration and the addition of new responsibilities affected states' ability to respond to the priorities and mandates of the Perkins Act?

This question is addressed in Chapter 3, "The State Administration of the Perkins Act," which examines changes in staffing and responsibilities within state offices of vocational education, as well as the interactions between the federal government, states, and localities in implementing the Act.

Effects of the Perkins Act on Localities

The NAVE also concluded that, contrary to Congressional intent, localities seldom used Perkins basic grant funds for program improvement. In response, the 1990 Perkins Act focuses to an unprecedented extent on encouraging localities to implement specific vocational education reforms. The Act encourages or requires the development of an "all aspects of the industry" curriculum for vocational programs, and the integration of academic and vocational education. It also provides funds specifically for the development of tech-prep programs, and stresses the provision of supplemental services to guarantee access to quality vocational programs for special population students. The Congress wants to know if these mandates and priorities are working:

- Is the Perkins Act having an effect at the local level?

This issue is addressed in numerous chapters within the Report. Chapter 6 ("State and Local Responsibilities Concerning Special Populations") examines the extent to which Perkins-funded localities provide supplemental services for special population students; Chapter 12 ("Integration of Academic and Vocational Curricula") and Chapter 13 ("Tech-Prep Programs") assess local efforts to implement program improvement initiatives.

Student Participation in Vocational Education

The historical emphasis on improving the access of students with special needs to vocational education continues in the 1990 Perkins Act, although in a new legislative form. Rather than providing separate funds for special population students, the 1990 Act targets funds to localities with high concentrations of special population students and strengthens assurances that the needs of these students will be met and that their participation will be actively sought. The concern with participation in vocational education also extends to students in general, where enrollments provide an indication of the health of the vocational education system. To address these issues, we examine patterns and trends in student access and participation, the provision of supplemental services that improve access for special population students, and the extent to which states and localities fulfill their mandated responsibilities in this area.

Access to and Participation in Vocational Education

Special population students had been found in previous decades to be under-represented in vocational education, raising concerns about access to vocational education for these students. To ensure equitable participation, the Perkins Act requires that states provide assurances that special population students have equal access to vocational education and that localities ensure their full participation in Perkins-funded programs:

- What are the patterns of access and participation for special population students at the secondary and postsecondary levels?

Chapter 4 ("Participation in Secondary Vocational Education") and Chapter 5 ("Participation in Postsecondary Vocational Education") address these issues. These chapters examine the access of secondary students to area vocational schools, which have relatively strong vocational programs, and the accessibility of postsecondary institutions to poor and LEP students. Current enrollment levels of all students, and of special population students, are also examined in these chapters, as are trends in these enrollments over time.

Services for Special Population Students

To ensure that the merging of set-asides for disabled and disadvantaged students with program improvement funds did not result in a reduction of supplemental services for disabled, disadvantaged, and LEP students, the 1990 Perkins Act expanded the assurances it requires for equal access and service provision. But the concern remains:

- Have services for special population students been reduced as a result of the loss of set-aside funds?

This issue is addressed in Chapter 6 ("State and Local Responsibilities Concerning Special Populations"). This chapter compares the level of service provision between funded and unfunded localities, and changes in services before and after the implementation of the 1990 Act.

State and Local Responsibilities Concerning Special Populations

To further ensure that special population students are provided equal access to quality vocational education, the Perkins Act requires that states and localities monitor these students' participation, and include special population representatives in various Perkins planning and development activities. This raises the following issue:

- To what extent are states and localities fulfilling their responsibilities concerning special population students?

Chapter 6 also addresses this issue. The chapter examines responsibilities carried out within state education agencies and states' efforts to help localities meet equal access provisions, and reviews the extent to which localities involve special population representatives in Perkins activities. In addition, responsibilities concerning students served by the Perkins funds reserved for sex equity and single parents are addressed in Chapter 7 ("Programs for Sex Equity and Single Parents, Single Pregnant Women, and Displaced Homemakers"). This chapter reviews the responsibilities of the State Sex Equity Administrators, and the services provided by localities that receive these program funds.

The Final Report will examine other special needs groups, including those receiving Perkins Native American tribal funds, those in correctional facilities, and minorities in VSOs.

Teachers and Classes in Vocational Education

The previous NAVE expressed concern about the academic dimension of vocational education programs, a concern that has been reinforced by labor market trends toward more skilled, technical work and changes in the organization of the workplace. In response to these concerns, the Perkins Act stresses the need for vocational programs to use and strengthen students' academic knowledge. One method for doing so is to combine academic and vocational skills in an "integrated" curriculum. To assess the degree to which vocational programs can or do include an academic focus, we examine the backgrounds of vocational teachers and the nature of instruction in vocational classes.

Teachers in Vocational Education

In line with federal concern about the quality of vocational education, and with the Perkins Act's emphasis on the academic preparation of vocational students, the mandate calls for an assessment of vocational and academic teachers within the vocational curriculum, and the possibility of shortages of vocational teachers. Of particular interest is the ability of teachers to contribute to the development of academic skills and to integrated education. Two questions of interest are thus:

- How well prepared are vocational and academic teachers to meet the Perkins goal of improving vocational students' academic skills and integrating curricula?
- To what extent are qualified vocational teachers in short supply?

Chapter 8 ("Teachers in Vocational Education") examines teachers' educational and occupational qualifications and assesses the question of shortages. Most data currently available are for secondary teachers, but existing data on postsecondary instructors' qualifications are included as well.

Academic Learning Within Vocational Education

Given the growing need for conceptual skills and technical competence in the workforce, the extent to which these abilities are being acquired by vocational students and to which vocational programs attempt to provide them are important issues in the Perkins Act. The Final Report will examine the academic outcomes of vocational education. Here, we examine these related issues:

- What is the academic content and rigor of vocational courses?
- What prerequisites and other requirements are included in vocational programs?
- How extensive is the academic coursetaking of vocational students?

The academic content and requirements of vocational education are examined in Chapter 9 ("Teaching Practices and Class Characteristics of Secondary Vocational Education"). This chapter reviews the teaching methods, academic and conceptual skills covered, program requirements, and homework and grading practices used in secondary-level vocational classes. The coursetaking of secondary vocational students is reviewed in Chapter 4 ("Participation in Secondary Vocational Education"). This chapter compares the academic coursetaking of students defined as vocational with that of "college prep" and "general track" students.

Education Reform and Program Improvement

In the wake of the 1983 report, *A Nation At Risk,* [9] education reform has focused on increasing students' academic knowledge and coursetaking. High school graduation standards and college entry requirements have been raised, educational accountability systems have spread, and new methods for assessing academic skills have been developed. Vocational education has been largely ignored by most of these reform efforts, prompting concern by some that vocational education and its students have been left to flounder.

Partly in response to this situation, more recent reforms focus on developing a stronger, better-integrated academic foundation for vocational education programs — in effect, a move toward the Dewey model of occupational education. For example, in 1984, the National Commission on Secondary Vocational Education published *The Unfinished Agenda: The Role of Vocational Education in the High School,* [10] which proposed that academic and vocational curricula be integrated, forming a more coherent, relevant curriculum for all students. A year later, Dale Parnell published *The Neglected Majority,* [11] which stressed the value of vocational education for the "middle half" of students, and developed the tech-prep concept.

The 1990 Perkins Act echoes these calls for reform. With its emphasis on integrated academic-vocational programs and provisions for tech-prep, the 1990 Act can be considered the Congress's first attempt to provide schools with specific guidance and motivation for bringing vocational education into the forefront of the education reform movement.

The Effects of Education Reform on Vocational Education

While there has been growing focus on efforts to reform vocational education, the major reform initiatives of the past decade have focused almost exclusively on academic education. Many vocational educators argue that the increased emphasis on academics has harmed vocational education by lowering its status and appeal and by reducing students' ability to fit vocational courses into their schedule. But a growing focus on vocational education reforms, including those in the Perkins Act, may work to counteract this trend. So we can ask:

- What effects have education reform efforts had on vocational education?

This issue is addressed in Chapter 10 ("Effects of Education Reform on Vocational Education"), which examines the nature and extent of various reform efforts, and the effects of reform on numerous aspects of vocational education.

The Implementation of Perkins Reform Initiatives

The Perkins Act unites vocational education with the accountability movement by mandating the development of state systems of vocational performance standards. The Act also responds to the need to improve the "school to work transition," a concern also emphasized in the currently proposed School-to-Work Opportunities Act. Initiatives to improve the school-to-work transition center on integrated vocational-academic curricula, tech prep programs, and work experience programs.

The obvious question about each of these initiatives is, to what extent are these reforms being implemented? More specifically:

- What progress are states making in developing the required performance measurement system?

- How extensive is the integration of academic and vocational curricula, and what evidence is there of its effectiveness?

- How extensive and well-developed are tech-prep programs, and what evidence is there of their effectiveness?

- How extensive are work experience programs, and how effective are they?

These issues are addressed in Chapters 11–14. Chapter 11 examines "Performance Standards and Measures," including a description of the steps states and localities have taken to develop and implement standards at the secondary and postsecondary levels. "Integration of Academic and Vocational

Curricula" is examined in Chapter 12, which evaluates the depth and breadth of these efforts among localities, and the evidence on the effectiveness of integration and "contextualized" learning. Chapter 13 explores the characteristics of "Tech Prep Programs" and their prevalence; there are currently no data on the effectiveness of these programs, but problems that could limit their success are noted. Finally, Chapter 14 evaluates the extent and nature of "Work Experience Programs," including "co-op," general work experience, and apprenticeship programs. The chapter also reviews existing evidence of the effectiveness of co-op programs (the most common work experience programs) in improving students' success in the labor market.

The Employment Outcomes of Vocational Education

The ultimate goal of vocational education is to prepare students for the labor market. If vocational education is effective, students who complete vocational programs should have more labor market success than students who do not complete these programs. They should have better incomes, employment rates, and/or upward mobility within an occupation. The Perkins Act hopes to help vocational education achieve this goal:

- Does vocational education improve students' employment outcomes?

This issue is addressed in Chapter 15 ("Employment Outcomes"), which examines evidence on the extent to which secondary and postsecondary vocational education contributes to employment success, including wage rates and employment patterns.

DATA SOURCES

To address the issues listed above, the National Assessment used a variety of research and data collection efforts. These include surveys developed specifically for the Assessment; analysis of existing U.S. Department of Education (ED) surveys; literature reviews; and studies conducted by ED research centers (see Appendix Table A-1.1). In this section, we provide an overview of the major cross-cutting data collection effort for the National Assessment — the Omnibus Surveys and their associated case studies and survey follow-up. The Technical Appendix provides detailed information on the sampling and methodology used in the Omnibus studies and in the Assessment's other major data sources.

Omnibus Surveys and Case Studies

The Omnibus Surveys are a set of interlinked paper-and-pencil surveys designed to be completed by vocational education administrators at state education agencies, regular and vocational school districts, public secondary schools, and public two-year postsecondary institutions. It includes seven surveys, with each survey covering a wide range of issues related to the condition of vocational education and the implementation of the Perkins Act (see Appendix Table A-1.2). The surveys were administered at the end of the first school year in which the 1990 Perkins Act was implemented, Spring 1992. They were administered to state directors in all 50 states, the District of Columbia, and the six U.S. territories that receive Perkins funds; to a sample of 1,797 public school districts and all 443 vocational school districts; to all 1,130 vocational schools located within districts included in the survey; to a sample of 2,000 regular high schools located in surveyed districts; and to all 992 public two-year postsecondary institutions, the institutions that receive the majority of Perkins funds at the postsecondary level.

From the Omnibus Survey samples, 20 sites where at least one institution responded to the surveys were selected for Community Case Studies. At each site, detailed interviews were conducted with as many of the following groups as possible: District vocational staff; secondary and postsecondary schools' administrative staff, teaching staff, students (both vocational and academic); parents of secondary vocational students; and local employers and other community members with an interest in the local vocational education system. Case study researchers also toured facilities and observed in vocational classrooms. The interviews covered the topics addressed in the Omnibus Surveys, and were conducted from November 1992 to March 1993, the second year of implementation of the 1990 Perkins Act. These case studies provide a richer, more in-depth look at many of the implementation issues of interest in the National Assessment, such as the extent of academic-vocational integration, the nature of tech-prep programs, and the availability of services for special population students.

Finally, to obtain the most recent data possible from a large, representative sample of educational institutions, a Follow-up Omnibus Survey was conducted in Spring 1993. This paper-and-pencil survey included the state, district, and postsecondary institution administrators from a sample of sites that had received the original Omnibus Surveys. The survey instruments were shortened versions of the original Omnibus Surveys, with telephone (CATI) versions used to guarantee quick-turnaround for late responders. These surveys, in combination with the original Omnibus Surveys, provide information on progress in implementing the Perkins Act from 1991–92 to 1992–93.

This Interim Report includes information from both the original Omnibus Surveys and the Community Case Studies. The Omnibus Survey findings are derived from analyses conducted by National Assessment staff and contractors, including the National Center for Research on Vocational Education (NCRVE). Also included are the findings from a summary report on the Community Case Studies and from individual case study reports. The Omnibus Follow-up Survey data were not available in time to incorporate in this report; they will be included in the Final Report.

OUTLINE OF THE INTERIM REPORT

The body of the report is divided into five parts, based on the research issues discussed above. These parts and their constituent chapters are:

Part I: Perkins Funding and Administration

- Chapter 2 examines the distribution of Perkins funds to localities, including the extent to which funds are concentrated at fewer sites and targeted to sites with more special population students.

- Chapter 3 reviews the effects of the Perkins Act on state vocational education administration, and examines states' capacity to address the priorities of the Perkins Act.

Part II: Student Participation in Vocational Education

- Chapter 4 examines at the secondary level trends in vocational coursetaking, the access to and participation of special population students in vocational education, and the academic coursetaking of vocational students.

- Chapter 5 explores trends in vocational coursetaking and the access to and participation of special population students in vocational education at the postsecondary level.

- Chapter 6 reviews the extent to which states and localities involve special population representatives in Perkins planning and implementation activities, the extent to which localities provide supplemental services for vocational special population students, and the effects of the elimination of set-aside funds on services for special population students.

- Chapter 7 examines Perkins-funded sex equity programs and programs for single parents, single pregnant women, and displaced homemakers, including the roles and responsibilities of the state administrators responsible for these programs and the services provided by funded programs.

Part III: Teachers and Classes in Vocational Education

- Chapter 8 reviews the educational backgrounds and work-related experience of vocational education teachers, the extent to which vocational and academic teachers are prepared to teach integrated curricula, and evidence on potential shortages of secondary vocational education teachers.

- Chapter 9 looks at the teaching methods, topics covered, occupational training requirements and homework and grading practices in secondary vocational classes.

Part IV: Education Reform and Program Improvement

- Chapter 10 examines the nature and extent of recent education reform efforts, and their impact on secondary vocational education.
- Chapter 11 reviews states' progress in developing and implementing the Perkins-mandated vocational education performance measurement system.
- Chapter 12 reviews the nature and extent to which secondary and postsecondary schools are developing or adopting integrated curricula, examines evidence on the effectiveness of "integrated" learning, and assesses efforts to develop an "all aspects of the industry" curricula.
- Chapter 13 inquires into the characteristics of tech-prep programs, their prevalence, and the growth of these programs over time.
- Chapter 14 focuses on school-to-work programs, examining the characteristics and prevalence of existing programs and reviewing evidence on their effectiveness.

Part V: The Employment Outcomes of Vocational Education

- Chapter 15 assesses the economic benefits to students of secondary and postsecondary vocational education.

ENDNOTES

1 The 1990 Perkins Act defines special population students as "individuals with handicaps, educationally and economically disadvantaged individuals (including foster children), individuals of limited English proficiency, individuals who participate in programs designed to eliminate sex bias, and individuals in correctional institutions."

2 Barro, S.M. (1994). The Interstate Distribution of Federal Funds for Vocational Education. Draft report prepared for the National Assessment of Vocational Education. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

3 This section is based largely on Millsap, M.A., and Muraskin, L.D. (in press), *Federal Vocational Education Policy in the U.S.* It also draws from the background sections of the 1968, 1974 and 1984 federal vocational education acts, as well as other sources cited within the text.

4 Kantor, H., & Tyack, D. (1982), *Work, Youth, and Schooling — Historical Perspectives on Vocationalism in American Schooling.* Stanford, CA: Stanford University Press.

5 In 1917 less than 20% of all 17-year-olds graduated from high school (National Center for Education Statistics (1991), *Digest of Education Statistics,* p. 105).

6 Millsap & Muraskin, op. cit.

7 Elementary students are the principal recipients of federal funds for educationally and economically disadvantaged students (Title I ESEA funds) and for LEP students (Title VII ESEA funds).

8 Lana D. Muraskin, personal communication, June 1993.

9 National Commission on Excellence in Education (1983), *A Nation at Risk: The Imperative for Educational Reform,* Washington DC: U.S. Department of Education.

10 National Commission on Secondary Vocational Education (1984), *The Unfinished Agenda: The Role of Vocational Education in High School,* Columbus, OH: National Center for Research in Vocational Education.

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PART I

PERKINS FUNDING AND ADMINISTRATION

CHAPTER 2

PATTERNS OF PERKINS FUNDS ALLOCATIONS

INTRODUCTION

Beginning with the Smith-Hughes Act of 1917, the federal government has assisted vocational education by providing funds to states, which retain some of the money for state-level activities and allocate the rest to local vocational education programs. This chapter examines how states allocate 1990 Perkins Act funds to school districts and postsecondary institutions. It compares funding allocations in 1991–92 (FY92), under the current Act, with those in 1990–91 (FY91), the last year under the previous Perkins Act.

Until the 1960s, the principal goal of federal legislation was the general support of vocational education. Since the late 1960s, however, the legislation has had two broad goals — program improvement and the provision of services for special needs students. The Carl D. Perkins Act of 1984 provided for special needs students by setting aside 57 percent of a state's basic grants to localities for such students. However, the Act proposed few rules for the distribution of the remaining funds, which were to be used for program improvement. The only general requirement was that over half of all basic grant funds be spent in economically depressed communities within a state.

A number of studies found allocation problems with federal vocational education funding under the 1984 Perkins Act.[1] First, funds were being broadly distributed across school districts in small grants. The median award to regular districts was only $7,900 in 1986–87, too little to have much effect in improving programs. Second, the set-asides for special populations tended to generate an "us" versus "them" atmosphere, in which services for special needs students were pitted against program improvement. In addition, there was too little targeting of funds on special needs students. For example, students in economically depressed areas often received less program improvement money, on a per-pupil basis, than those in other areas.

The 1990 Perkins Act attempts to resolve these problems. To counteract the tendency of states to distribute funds thinly across many districts, it requires school districts to qualify for grants of at least $15,000 (based on a formula to be described shortly) as a condition of funding. (The minimum grant for postsecondary institutions is $50,000.) Presumably this amount would be sufficient for at least some program improvement. Districts that cannot qualify for the minimum grants are given the option of combining into consortia that can qualify. It was assumed that small districts would be the most likely to form consortia for this purpose. Another provision allows states to waive the minimum for small districts in sparsely populated areas.

To reduce the tension between services for special populations and program improvement, and to assure targeting of funds on eligible recipients with large numbers of special needs students, the 1990 Perkins Act eliminates the set-asides for disadvantaged students, disabled students and adults. Instead, it requires states to allocate local basic grant funds by formulas heavily weighted toward programs with large numbers of disadvantaged students (and disabled students at the secondary level). In this respect, the intent of the Act is to improve vocational education programs especially in districts with high concentrations of special populations students, defined as the educationally and economically disadvantaged, the disabled, the limited English proficient, and students in programs nontraditional for their gender (e.g., female students in auto mechanics).[2]

This chapter first compares the mixes of federal resources available to eligible recipients under the 1984 and 1990 Perkins Acts; then describes the allocation mechanisms of the 1990 Perkins Act; and then examines the states' division of basic grants between the secondary and postsecondary sectors. Within each sector, the following sections describe the distribution of Perkins funds among recipients (with particular attention to the role of consortia at the secondary level), and assess the extent to which Perkins funds are targeted on districts and postsecondary institutions with high concentrations of special population students.

COMPARISON OF FEDERAL RESOURCES UNDER 1984 AND 1990 ACTS

In later sections, we will compare funding allocations under the 1984 Perkins Act with those under the 1990 Perkins Act. Because the 1990 Act combined and renamed some types of funds in the 1984 Act, this comparison is not straightforward. To clarify the relationship, Table 2.1 lists comparable funds under the two Acts.

In both Acts, each state receives a "basic state grant" through the same interstate formula.[3] Title II sets forth the provisions for the basic state grant. In the 1984 Act, seven percent of the basic grant was allocated for state administration (described in Title I), and states could reserve up to an additional 13 percent of other Title II funds for administrative purposes. The remaining basic grant funds were allocated to local programs, partly through a series of "set asides" and partly through program improvement grants. The set-asides included six categories of funds, for disabled students, disadvantaged students, adults, single parents and displaced homemakers, vocational sex equity, and corrections education. The disabled and disadvantaged set-aside funds were allocated via formulas, and the remainder were allocated at the state's discretion.

Table 2.1
Comparable Perkins Funds Under the 1984 and 1990 Perkins Acts[a]

1984 Perkins Act		1990 Perkins Act	
Title I: Assistance to States		**Title I: Assistance to States**	
State Administration (7%)		State Administration (5%)	
Title II: Basic State Grant		**Title II: Basic State Grant**	
		State Programs and Leadership	(8.5%)
Set-Aside Funds:		Set-Aside Funds:	
Sex Equity & Single Parent Programs	(12%)	Sex Equity & Single Parent Programs	(10.5%)
Corrections Education	(1%)	Corrections Education	(1%)
Disabled Students	(10%)		
Disadvantaged Students	(22%)		
Adult Students	(12%)	Basic Program Funds	(75%)
Program Improvement Funds	(43%)		
Title III: Special Programs		**Title III: Special Programs**	
Programs with CBOs		Programs with CBOs	
Consumer & Homemaking Programs		Consumer & Homemaking Programs	
		Tech-Prep Education	

[a] In the 1984 Act, states could keep up to 20% of basic grant funds (including the 7% state administration funds) for state programs. Also, state administration funds were taken "off the top" in 1984, but not in 1990. Thus, 1984 Title II funds sum to 100%, but 1990 Title II funds sum to 95% (with state administration funds providing the other 5%).

In the 1990 Act, funding for state administration decreased, and some of the local set-aside funds were merged with program improvement funds. Now, states can reserve up to five percent of basic grant funds for state administration, and can take up to an additional 8.5 percent for "state programs and leadership." As a result, states now can reserve up to 13.5% of basic grant funds, rather than up to 20%, and the difference goes to localities.

Local funds are currently divided into only three set-asides (sex equity, single parent, and corrections). The former set-asides for disabled, disadvantaged and adult students are merged with program improvement funds to form "basic program" funds, allocated to school districts and postsecondary institutions by formula in response to local plans. In the 1990 Act, these funds constitute 75% of a state's basic grant, compared to 69–81% in the 1984 Act (depending on the state's "cut").

In this report, we will refer to both the 1990 basic program funds and the comparable 1984 set-asides and program improvement funds as basic local grant funds (or, more simply, as basic grants).

The other major funding change between the 1984 and 1990 Acts is the addition of Title III, Part E funds for tech-prep programs. We will typically examine these funds separately, except when localities' "total" Perkins funds are compared.

DESCRIPTION OF THE CURRENT FUNDS ALLOCATION MECHANISMS

Funds Subject to Distribution by Formula

The 1990 Perkins Act prescribes intrastate distribution formulas covering a substantially larger fraction of basic grant funds than previous legislation. [4] The Amendments include two sets of provisions that affect the availability of federal resources for localities. These include: (a) rules on how the funds in the basic state grant are to be divided among functions (i.e., basic grants to localities, sex equity and single parent program funds, statewide projects), and (b) rules for distribution of local basic grant funds (which account for about three-quarters of all funds in the state basic grant). In this section, we shall describe the first set of rules briefly, and then describe the allocation of basic local grant funds.

Under the 1990 Act, of Title II funds (basic grant funds) that flow to the states:

- At least 75 percent must be allocated to local basic grants (i.e., grants to eligible recipients that are awarded based on formulas).
- 10.5 percent is to be allocated to programs for single parents, displaced homemakers, and single pregnant women, and the sex equity program. [5] Of these funds, at least 7 percent must be spent on the single parent program and at least 3 percent on the sex equity program.
- Up to 8.5 percent may be allocated to various state programs and activities.

- Up to 5 percent (or $250K, whichever is greater) may be spent for state administration of the state plan, of which at least $60K must be spent to provide a full-time position the responsibility of which is to administer the single parent program, the sex equity program, and related activities.

- 1 percent is to be allocated to programs for criminal offenders.

Most of this chapter examines the allocation of the 75 percent of Title II funds in the basic grants to localities.

The Division of Funds Between Secondary and Postsecondary Education

The 75 percent of the funds for basic grants to localities is subject to various allocation rules. First, the Act asks states to estimate what amounts (or percentages) of the total allocation are to be distributed to secondary and postsecondary/adult education. [6] While the 1990 Act does not specify particular shares of resources for any set of potential recipients, it does ask states to make their "share" decisions public in the plans they submit to the federal government.

Allocations Among Secondary Institutions

The formula for allocating funds to LEAs: The 1990 Amendments specify a formula that allocates basic grants to local education agencies (LEAs) according to three factors:

> 70 percent of the funds for LEAs are to be allocated based on the LEA's share of resources under Section 1005 of the Elementary and Secondary Education Act (i.e., the Chapter 1 basic grant) in the preceding fiscal year. In other words, if the LEA received 6 percent of the Chapter 1 basic grant resources in the state that year, it would receive 6 percent of 70 percent of the Perkins funds going to LEAs.
>
> 20 percent of the funds to LEAs are to be allocated based on the number of disabled students with IEPs called for by Section 614 of the Education of all Handicapped Act in the preceding year. In other words, if the district had 8 percent of all the IEPs in the state last year, it will receive 8 percent of 20 percent of Perkins funds going to LEAs.
>
> 10 percent of the funds to LEAs are to be based upon the number of enrollees in schools and "adults in training programs" operated by LEAs in the preceding fiscal year in relation to the total numbers of such persons in all LEAs in the state. So if the LEA had a total of 7 percent of students in school and adults in training programs

combined, it would receive 7 percent of the 10 percent of funds to LEAs distributed in this manner.

As noted earlier, the legislation specifies a minimum grant award of $15,000 and indicates that districts unable to qualify for a $15,000 award under the formula may wish to form consortia to qualify for an award.

Provision for shifting funds to area vocational schools and intermediate agencies: In addition to the formula for school district allocations, the legislation outlines the conditions under which resources for secondary education can be distributed to institutions not part of regular school districts. These institutions include secondary area vocational schools and intermediate agencies. To receive funds, the area school or agency must form a consortium or enter into a cooperative agreement with an LEA that feeds students to it. The area vocational school or intermediate agency must also demonstrate to the state that it serves an equal or greater percentage of economically disadvantaged or disabled individuals than the proportion served by the LEA that feeds students to it *or* that its rate is lower because disadvantaged and/or disabled students from the LEA lack interest in attending.

If these conditions are met, the amounts of federal funds for the area school or intermediate agency as well as for the LEA in question will be based on each entity's relative share of disadvantaged and disabled students "attending vocational education programs." Because area vocational schools do not receive Chapter 1 funds, the count of economically disadvantaged students used to determine the division of funds may be based on other criteria, including one or more of the following: the numbers of students receiving free or reduced price lunch, the numbers of students in families receiving AFDC or food stamps, the number receiving Chapter 1 services, or other criteria (if approval is received). An appeals procedure is mandated for any disputes arising from this allocation process, and LEAs with very small allocations are urged to join consortia or transfer allocations to area schools or intermediate agencies.[7]

Allocations Among Eligible Recipients at the Postsecondary Level

The federally prescribed formula: At the postsecondary level, grant allocations are to be made to each institution based on its share of the statewide number of students "enrolled in vocational programs" who were recipients of Pell Grants or assistance from the Bureau of Indian Affairs (BIA) during the preceding year. The formula is the same for all types of institutions. Each eligible recipient is to receive a share of resources equal to its share of the state's total number of Pell Grant recipients and recipients of assistance from the Bureau of Indian Affairs enrolled in vocational programs.

Waivers may be granted to states that demonstrate that the formula does not result in funds being distributed to institutions with the highest numbers of economically disadvantaged students, but that an alternative formula would have that effect. At the postsecondary level, a minimum award level of $50,000 is established.

PRELIMINARY ALLOCATION EFFECTS OF THE 1990 AMENDMENTS

To determine the initial effects of the changes in federal rules, data were collected from state vocational education authorities on numbers and dollar amounts of awards to eligible recipients (secondary and postsecondary) under the basic grant and Title III of the Act. [8] Data were collected for both the final year under the previous legislation (1990–91, called FY91 in this chapter) and the first year under the 1990 Amendments (1991–92, called FY92 in this chapter). In addition, the chapter draws on information from the Omnibus Surveys of school districts and postsecondary institutions, which asked respondents about allocations in both years. [9] At several points, data are compared with findings from earlier studies of funds allocations. It is important to remember that the data presented here reflect the first year of the new legislation. The first year was a transition period in which states and localities began to respond to new requirements. [10] The data presented are preliminary, and analysis of the data sets is ongoing.

Secondary and Postsecondary Shares of Basic Grant Funds

Intent of federal rules: Although the federal legislation takes no position with respect to how much of the basic grant should be distributed to each sector, it does require states to estimate the shares of funds to each sector and report the estimate in their state plan for using federal funds. [11] Requiring that this important decision be visible in the planning process is a departure from previous rules, where the secondary and postsecondary shares of funds were ignored in legislation. Presumably, the discussions, negotiations, and assessments of need preceding the development of state plans should play a role in the decision on shares to each sector.

Findings: Table 2.2 shows comparable basic grant funds allocated to postsecondary institutions in FY 1991 and FY 1992. [12] According to state-level allocation data, there was a relatively small decline, nationwide, in allocations to postsecondary education between the final year of the 1984 legislation and the first year of the 1990 Act. Specifically, 40.2 percent of Title II funds were allocated to postsecondary grantees (under the set-asides for disadvantaged, disabled, and adults, and for program improvement) in FY91, the last year of the previous legislation, and 38.1 percent of the local basic grant (i.e., formula) funds were allocated in FY92, the first year of the 1990 Act (Table 2.2), a 2.1 percentage point decline.

Table 2.2
Local Basic Grant Funds Allocated to Postsecondary (PS) Institutions, FY91 and FY92

State	Average PS Inst. Grant FY91	Number of PS Inst. FY91	Percent FY91 Funds Allocated to PS Inst.	Average PS Inst. Grant FY92	Number of PS Inst. FY92	Percent FY92 Funds Allocated to PS Instit.
Alabama	$69,214	41	25.7%	$134,557	31	33.8%
Alaska			No Response			
Arizona	$485,220	12	58.1	$145,362	9	14.4
Arkansas	$57,176	28	33.3	$102,991	20	29.0
California	$374,328	71	50.4	$473,164	69	54.7
Colorado	$191,248	25	70.2	$225,286	21	60.0
Connecticut	$23,909	18	9.5	$108,656	12	21.5
Delaware	$13,890	19	9.1	$24,444	19	15.0
Florida	$250,703	45	40.6	$279,293	46	47.2
Georgia	$248,534	41	53.8	$280,757	32	49.9
Hawaii	NA	NA	46.0	NA	NA	50.0
Idaho	$163,419	7	32.2	$134,721	7	30.0
Illinois	$228,853	39	40.5	$224,412	37	34.0
Indiana	$311,847	20	39.3	$261,835	22	36.4
Iowa	$351,725	16	75.6	$357,638	15	72.0
Kansas	$84,541	54	72.0	$138,747	26	50.0
Kentucky	$83,572	36	39.8	$196,845	32	55.7
Louisiana	$71,513	63	36.0	$122,328	47	44.0
Maine	$172,859	8	56.3	$164,162	9	47.4
Maryland	$128,114	21	28.8	$183,366	16	30.0
Massachusetts	$156,223	16	19.3	$182,450	16	18.9
Michigan	$175,247	39	31.7	$301,134	31	42.0
Minnesota	$331,483	29	94.4	$512,501	18	90.8
Mississippi	$344,740	15	53.4	$304,092	16	54.3
Missouri	$190,033	29	37.5	$185,341	21	30.0
Montana	$90,076	13	43.6	$85,109	13	35.0
Nebraska	$116,711	15	42.6	$370,067	6	50.0
Nevada	$187,801	6	33.3	$195,345	4	25.0
New Hampshire			No Response			

(continued)

Table 2.2 (continued)
Local Basic Grant Funds Allocated to Postsecondary (PS) Institutions, FY91 and FY92

State	Average PS Inst. Grant FY91	Number of PS Inst. FY91	Percent FY91 Funds Allocated to PS Inst.	Average PS Inst. Grant FY92	Number of PS Inst. FY92	Percent FY92 Funds Allocated to PS Instit.
New Jersey	$125,570	19	25.2	$233,224	17	23.3
New Mexico	$207,142	22	99.0	$269,906	16	92.1
New York	$128,985	77	30.6	$191,204	56	33.7
North Carolina	$103,608	58	31.3	$113,402	51	30.6
North Dakota	$85,148	15	39.7	$150,498	8	35.2
Ohio	$244,545	33	34.0	$145,125	36	17.8
Oklahoma	$24,907	34	8.8	$114,577	13	16.0
Oregon	$168,128	16	50.0	$269,986	13	49.7
Pennsylvania	$146,119	67	30.3	$214,604	43	29.0
Rhode Island	$105,148	3	13.0	$316,300	1	10.5
South Carolina	$58,993	16	9.9	$82,795	17	13.2
South Dakota	$214,663	6	44.0	$441,571	4	58.2
Tennessee	$76,609	52	26.5	$48,780	41	14.1
Texas	$345,290	70	52.0	$393,448	56	43.9
Utah	$225,320	13	52.5	$240,422	9	40.0
Vermont	$69,404	8	17.4	$206,829	3	20.2
Virginia	NA	NA	15.0	NA	NA	15.0
Washington	$165,203	24	NA	$221,341	29	NA
West Virginia	$100,263	13	25.7	$158,941	8	22.8
Wisconsin	$421,226	17	58.7	$420,462	16	55.0
Wyoming			No Response			
Totals	$177,116	1,289	40.2	$223,922	1,032	38.1

Source: State Finance Record Collection

State plan development and other factors did lead to some reallocation of funds across levels between FY91 and FY92, but in most states the changes were relatively modest. In the 45 states for which data are available in both years, 8 report changes of 10 percentage points or more (e.g., a change of 22 percent to 32 percent) in the secondary/postsecondary split. Another 9 states report changes of 8 or 9 percentage points, and most states report smaller changes in allocations. Five states allocated 15 percent or less of local basic grant funds to postsecondary education in FY92, and two states allocated 15 percent or less to secondary education. Thus, there are 7 (of 46 states) that could have qualified for a waiver of basic grant formula allocation rules for one sector or the other. This number of states is slightly larger than the 3 (of 48) states with allocations of 15 percent or less to one sector in FY87.[12]

If sex equity and single parent awards as well as Title III funds (among them, Tech Prep) are included in the analysis, the shares of funds to postsecondary education for both the old and new legislation move closer together (Table 2.3).[13] In the states for which comprehensive data are available, the share of funds to postsecondary was 41.8 percent in FY91 and 40.2 percent in FY92. The smaller difference between the years occurs because more than half the single parent and Tech-Prep funds are allocated to postsecondary providers in both years. [14] (The difference in the postsecondary shares in Tables 2.2 and 2.3 reflects the fact that Table 2.3 is based on 43 states, rather than 45.)

Despite the slight decline in federal resources to the postsecondary sector between FY91 and FY92, the long-term national trend in shares by sector appears relatively stable. In FY87, state vocational administrators reported a national average of 40 percent of basic grant funds to postsecondary education (defined as education beyond grade 12). [15] A survey of local education agencies, area vocational districts, and postsecondary institutions, conducted at the same time, showed that, of the basic grant funds flowing to localities, about 38 percent flowed to postsecondary grantees. [16] Both studies included sex equity and single parent awards in the analysis of basic grant awards. In short, national averages show a slight decline in the postsecondary share of federal resources between FY91 and FY92, but little change in the overall share of Perkins funds flowing to postsecondary education over the past six years.

Also relatively unchanged over time is the range of postsecondary allocation percentages across the states. Table 2.4 shows FY87 and FY92 state data on the percentages of local basic grant funds allocated to postsecondary grantees. As can be seen, at both points in time the vast majority of postsecondary awards were concentrated in the 10–60 percent range, and the percentage in each decile is roughly similar. The most noticeable change is the shift downward in overall percentages for postsecondary, so that no states remain in the 61–70 percent range in FY92.

Table 2.3
Percent of Basic Grant and Other Funds Awarded to Secondary and Postsecondary/Adult Level Providers, Carl D. Perkins Vocational Education Acts, FY91 and FY92 (N=43 States)

	FY91		FY92	
Type of Grant	Secondary	Postseondary	Secondary	Postsecondary
Basic program[a]	60.1	39.9	63.9	36.1
Sex equity	55.1	44.9	57.4	42.6
Single parents	40.9	59.1	48.8	51.2
Title III — Consumer and Homemaking	82.3	17.7	81.7	18.3
Title III — Tech Prep	NA	NA	30.4	69.9
Total, all types of grants	58.2	41.8	59.8	40.2
Total, without Tech Prep	NA	NA	62.7	37.3
Basic program and Tech Prep	NA	NA	60.6	39.4

a To maintain comparability, the basic program for FY91 includes the set-asides for handicapped and disadvantaged students and the set-aside for adults, as well as program improvement.

Source: State Finance Record Collection

We turn now to allocations within each sector, secondary and postsecondary. As the findings are reported, it is important not to lose sight of the fact that a critical independent determinant of per-recipient (or per-student) allocations in each sector is the percentage of the total state allotment the sector receives — that is, the secondary and postsecondary shares. This issue is discussed further at the end of the chapter.

Table 2.4
Distribution of Carl D. Perkins Local Basic Grant Funds[a] to Postsecondary Sector By Number of States, FY87 and FY92

Percentage of Federal Funds	Number of States	
	FY87	FY92
0–10	1	0
11–20	7	10
21–30	7	9
31–40	10	8
41–50	9	9
51–60	5	6
61–70	6	0
71–80	1	1
81–90	0	0
91–100	2	2
	n=48	n=45

[a] For FY87, data are for all basic grant funds (i.e., including sex equity and single parent awards).

Sources: FY87 data from *National Assessment of Vocational Education, Second Interim Report,* September 1988, Chapter 2. FY92 data from the State Finance Record Collection

Basic Program Allocations: Funds Assigned to Secondary Level

Intent of federal rules. The formula for allocations of local basic grant funds to school districts, 70 percent of which is based on Chapter 1 basic grant allocations, is clearly aimed at directing resources to districts with concentrations of children from poor families. Although the Chapter 1 allocation formula has itself been faulted for spreading resources too thinly among needy districts, using it as a means to allocate vocational education resources shows Congressional intent to concentrate resources in areas of poverty more than in the past. In contrast, the legislation assigns little weight to overall enrollment (only 10 percent of formula weight), and no weight to vocational enrollment.

As noted earlier, to forestall the distribution of very small awards, the 1990 Perkins Act sets a $15,000 minimum for basic grants to local districts. In order not to unduly penalize small districts, especially those with children from poor families, it allowed districts to form consortia which could qualify for the minimum grant. The regulations specified that one member LEA could be designated as a fiscal agent and that consortia must engage in joint service provision, not simply turn back funds to member LEAs. The legislation also allowed waivers to the minimum grant size for rural or sparsely populated areas.

Finally, Congress sought to give regular school districts a greater voice in funds distribution and rectify some of the imbalance in per-pupil awards between regular school districts and area vocational schools. Specifically, the requirement that funds for area vocational schools be awarded to school districts (LEAs) and then re-allocated to area schools meant that LEAs would decide whether to use federal funds to support area school programs used by their students. Theoretically, only if LEAs chose to establish or enter into consortia with AVSs would the area schools receive funding.

General findings. Between FY91 and FY92, the average basic grant award at the secondary level (Section 231) increased substantially, and the total number of awards dropped dramatically. According to state award data, in the final year of the 1984 legislation (FY91),the average secondary-level award was $44,516 and there were 7,625 separate awards. [17] These numbers combine awards to regular school districts and area vocational schools. In the first year of its implementation, the 1990 Act yielded 3,958 awards, and a mean award of $99,616. [18] This drop in the number of awards occurred because many school districts combined to form consortia, each of which could receive only one award. The 3,958 awards included 2,825 to individual school districts, and 1,133 to consortia. States identified 8,170 districts as belonging to consortia. Among the four broad census regions, consortia appear to be most common in midwestern states, and least common in the west. As a proportion of overall enrollment, consortia have fewer students from poor families and fewer minority students than individual districts receiving awards.[19]

Funding to school districts in large and medium sized cities increased relative to other districts under the new Act (Table 2.5). For 48 of the 51 largest U.S. cities for which school district award data are available, the average award increased from $1,247,523 in 1990–91 to $1,578,029 in 1991–92, an average increase of 26.5 percent in local basic grant funds. [20] In only 8 of the 48 cities did school districts actually lose funds. [21] These eight cities are located in four states that had previous policies favoring their largest cities even more than the current formula. For the next 127 cities in size (100,000 population or greater) for which data are available in both years, the increase in funds is comparable to that in the largest cities, on the order of 25 percent between the two years. [22] In comparison to large and medium sized cities, all other districts and consortia gained only 5 percent in basic program funds from FY91 to FY92.

These findings — much larger average grants, far fewer awards, and sizeable award increases to cities — suggest that the federally specified formula and the grant floor for the secondary sector have had an impact on where local basic grant funds are directed and how those funds are concentrated. But the large

Table 2.5
Percentage Change in Local Basic Grants to Districts in Large Cities: FY91 and FY92 (1990 Populations >300,000)

City	State	1990 City Pop. (1,000s)	91 Basic Grant	92 Basic Grant	Percent Change District	Percent Change Rest of State
New York	NY	7,323	$13,731,078	$11,824,628	-14%	13%
Los Angeles	CA	3,485	$4,128,829	$4,911,198	19	-5
Chicago	IL	2,784	$4,465,366	$7,129,799	60	4
Houston	TX	1,631	$536,363	$2,021,400	277	26
Philadelphia	PA	1,586	$4,654,781	$5,675,263	22	-5
San Diego	CA	1,111	$465,666	$849,059	82	-5
Detroit	MI	1,028	$2,382,010	$2,804,689	18	-18
Dallas	TX	1,007	$1,458,929	$1,433,331	-2	26
Phoenix	AZ	983	$445,123	$1,377,834	210	78
San Antonio	TX	936	$291,716	$1,072,830	268	28
San Jose	CA	782	$152,107	$163,117	7	-5
Baltimore	MD	736	$1,367,596	$2,698,567	97	-21
Indianapolis	IN	731	$612,889	$976,429	59	1
San Francisco	CA	724	$332,581	$504,771	52	-5
Jacksonville	FL	635	$1,243,453	$1,086,612	-13	-13
Columbus	OH	633	$939,446	$1,587,010	69	44
Milwaukee	WI	628	$1,043,231	$1,219,036	17	7
Memphis	TN	610	$2,093,613	$2,282,614	9	12
Washington	DC	607	NA	NA	NA	
Boston	MA	574	$848,196	$1,882,972	122	11
Seattle	WA	516	NA	NA	NA	
El Paso	TX	515	$1,049,920	$826,269	-21	26
Cleveland	OH	506	$808,812	$2,362,072	192	44
New Orleans	LA	497	$254,246	$1,218,672	379	-21
Nashville	TN	488	$892,127	$907,861	2	12
Denver	CO	468	$412,948	$626,517	52	57
Austin	TX	466	$803,503	$486,730	-39	26
Fort Worth	TX	448	$1,067,369	$641,024	-40	26

(continued)

Table 2.5 (continued)
Percentage Change in Local Basic Grants to Districts in Large Cities: FY91 and FY92 (1990 Populations >300,000)

City	State	1990 City Pop. (1,000s)	91 Basic Grant	92 Basic Grant	Percent Change District	Percent Change Rest of State
Oklahoma City	OK	445	$206,237	$738,890	258%	-24%
Portland	OR	437	$383,908	$520,052	35	31
Kansas City	MO	435	$411,624	$749,791	82	-14
Long Beach	CA	429	$413,310	$659,441	60	-5
Tucson	AZ	405	$542,148	$732,722	35	78
St. Louis	MO	397	$806,400	$1,456,042	81	-14
Charlotte	NC	396	$409,340	$735,158	80	-3
Atlanta	GA	394	$459,788	$946,970	106	-2
Virginia Beach	VA	393	$592,466	$711,527	20	18
Albuquerque	NM	385	$12,000	$80,000	567	770
Oakland	CA	372	$421,736	$626,774	49	-5
Pittsburgh	PA	370	$1,141,951	$957,932	-16	-5
Sacramento	CA	369	$415,061	$411,679	-1	-5
Minneapolis	MN	368	$86,757	$96,410	119	76
Tulsa	OK	367	$163,372	$692,871	324	-24
Honolulu	HI	365	NA	NA	NA	
Cincinnati	OH	364	$882,250	$1,317,575	49	44
Miami	FL	359	$3,059,005	$2,676,769	-12	-13
Fresno	CA	354	$529,912	$645,631	22	-5
Omaha	NE	336	$644,895	$486,833	-25	1
Toledo	OH	333	$512,992	$895,025	74	44
Buffalo	NY	328	$1,006,758	$556,564	-45	13
Wichita	KS	304	$297,274	$480,438	62	111
Total			59,881,081	$75,745,399	26%	7%
Average Award			$1,247,523	$1,578,029		

Source: State Finance Record Collection

decline in the number of awards has been accompanied by what appears to be a great increase in the number of school districts participating in the federal vocational education program. Fully 74 percent of all school districts participating in the federal program are now reported to be members of consortia. In 16 of the 43 states for which data are available, more than 90 percent of the districts are in consortia.

The findings about consortia suggest a more complicated picture of within-state allocations. According to state data, 8,170 districts are participating in consortia. This number alone is greater than the total number of districts receiving funding in the previous year. Added to the 2,825 districts with individual grants, the number of districts participating in basic grants appears to include almost all the school districts in the country. (There are about 11,300 districts with public secondary schools in the United States.)

At the district level, then, participation in Perkins local basic grant funding was much broader in FY92 than in FY91. In this sense, there was less concentration of funds than before. This shift is so marked, and the apparent participation of school districts so broad, that we must regard these findings as tentative. The proportion of districts actually using Perkins local basic grant funds is almost certainly smaller than these data indicate. For one thing, area vocational school consortia or cooperative agreements are probably included in the consortium data, and we know from the community case studies that some comprehensive districts in these consortia simply pass the funds through to the AVSs. Additional data on within-state allocations have been collected, but not yet analyzed. Further analyses and conclusions on this subject will be included in our Final Report.

The average consortium receives a larger award than the average separate district — $115,342 per consortium — and includes 7.2 school districts (see Table 2.6). This means that 35 percent of local basic grant funds going to secondary education are distributed to consortia, and that the average consortium participant would have qualified for an award on its own. So why did it join a consortium? How can we explain these findings?

It would appear that the notion of the consortium as a mechanism for a small number of districts to qualify for a minimum grant is simply not borne out by the data. As Table 2.6 shows, in only four states (of the 38 for which data were available) was the average grant to a consortium less than $30,000. In half of the states, the average consortium award was above $50,000 and in 14 of the 38 states with complete data it was over $100,000. In the states with average consortium awards above $100,000, consortia received an average of 74 percent of the state's federal funds allocated to secondary education. Use of the consortium mechanism to distribute sizeable shares of funds occurred in some of the most populous states as well as in some of the smallest states.

Table 2.6
State Allocations to Independent LEAs (Districts) and Consortia Perkins Act Local Basic Grants, FY92

State	Number of Indep. LEAs w/ awards	Average Award Per Indep. LEA	Average per Student Award in Indep. LEAs[a]	Number of Consor-tium Awards	Number of LEAs in Consortia	Percent LEAs in Consortia	Average Award Per Consortia	Average per Student Consortia Award[a]
Alabama	118	$67,603	$11.35	4	10	7.8%	$45,237	$7.56
Alaska				No Response				
Arizona	110	$70,942	$15.97	0	0	0.0	NA	NA
Arkansas	50	$50,667	$11.37	21	274	84.6	$119,024	$11.70
California	252	$102,154	$5.55	40	129	33.9	$31,384	$3.78
Colorado[b]	30	$94,580	$5.94	18	118	79.7	$42,227	$7.13
Connecticut	59	$69,673	$11.49	18	75	56.0	$36,650	$6.31
Delaware	0	NA	NA	3	19	100.0	$875,690	$60.64
Florida	65	$220,362	$7.95	1	3	4.4	$35,403	$7.41
Georgia	164	$53,923	$8.06	6	20	10.9	$28,934	$6.27
Hawaii	7	$223,315		0	0	0.0	NA	
Idaho	31	$48,192	$9.71	17	74	70.5	$41,557	$11.23
Illinois	1	$7,129,799	$18.04	57	556	99.8	$157,399	$6.55
Indiana	3	$446,738	$16.32	44	298	99.0	$198,102	$9.81
Iowa	0	NA	NA	16	437	100.0	$130,389	$4.18
Kansas	24	$78,468	$8.52	29	279	92.1	$59,455	$8.21
Kentucky	111	$38,700	$7.96	19	66	37.3	$37,066	$7.49
Louisiana	65	$112,576	$9.26	0	0	0.0	NA	NA
Maine	0	NA	NA	28	290	100.0	$58,468	$7.69
Maryland	24	$285,236	$9.66	0	0	0.0	NA	NA
Massachusetts	47	$109,197	$18.97	31	208	81.6	$238,115	$13.34
Michigan	1	$2,804,689		52	559	99.8	$193,685	
Minnesota	4	$55,594		25	334	98.8	$28,704	
Mississippi	79	$32,443	$8.06	33	74	48.4	$46,495	$7.83
Missouri	40	$85,979	$12.73	64	413	91.2	$88,148	$9.68
Montana	108	$17,714	$31.44	4	30	21.7	$35,420	$36.35
Nebraska	17	$64,295	$7.45	24	279	94.3	$46,891	$9.67
Nevada	9	$260,460	$11.64	0	0	0.0	NA	NA
New Hampshire				No Response				
New Jersey	94	$83,999	$11.73	36	186	66.4	$142,744	$11.45
New Mexico	7	$50,901		1	13	65.0	$15,000	
New York	5	$2,624,401	$9.69	41	669	99.3	$194,522	$4.72
North Carolina	133	$98,801	$12.03	0	0	0.0	NA	NA
North Dakota	12	$53,262	$39.77	36	197	94.3	$43,732	$56.91
Ohio	0	NA	NA	101	612	100.0	$239,183	$11.95

(continued)

Table 2.6 (continued)
State Allocations to Independent LEAs (Districts) and Consortia
Perkins Act Local Basic Grants, FY92

State	Number of Indep. LEAs w/ awards	Average Award Per Indep. LEA	Average per Student Award in Indep. LEAs[a]	Number of Consortium Awards	Number of LEAs in Consortia	Percent LEAs in Consortia	Average Award Per Consortia	Average per Student Consortia Award[a]
Oklahoma	88	$53,461	$13.54	48	362	80.4%	$64,902	$13.62
Oregon	64	$45,368	$25.85	18	120	65.2	$36,112	$1.80
Pennsylvania	65	$149,285	$21.10	72	425	86.7	$178,890	$10.77
Rhode Island	1	$721,729	$34.88	8	36	97.3	$247,807	$16.85
South Carolina	91	$101,729	$14.72	0	0	0.0	NA	NA
South Dakota	17	$43,129	$10.06	18	118	87.4	$29,616	$11.13
Tennessee	99	$104,219	$13.86	22	45	31.3	$86,123	$13.22
Texas[b]	322	$88,048	$8.87	67	406	55.8	$43,102	$8.04
Utah	0	NA	NA	9	40	100.0	$360,633	$7.45
Vermont[c]	0	NA	NA	17	58	100.0	$144,371	$24.84
Virginia	134	$105,127	$13.00	0	0	0.0	NA	NA
Washington	158	$23,570	$5.63	29	92	36.8	$32,186	$5.22
West Virginia	63	$68,482	$13.15	0	0	0.0	NA	NA
Wisconsin	53	$68,299	$7.34	56	246	82.3	$33,790	$6.22
Wyoming				No Response				
Totals	2,825	$89,609	$9.26	1,133	8,170	74.3%	$115,342	$9.01

[a] Based on data for 43 states.

[b] Estimated using FY93 data.

[c] LEA participation estimated based on 1990–91 NCES data on secondary school districts.

NOTE: Ohio and Illinois reported allocations to regional fiscal agents; as such, grants to individual LEA are excluded.

Source: State Finance Record Collection

It is not clear why there are so many consortia or why the consortium grants are so large. As noted earlier some consortia may be formed as a means to support area vocational facilities or intermediate agencies, others for other reasons. The formula for allocation of federal funds to secondary education is based primarily on Chapter 1 counts, and area schools rarely have Chapter 1 allocations (or students). Instead, they must form alliances with school districts (the legislation calls these consortia or cooperative agreements) and draw their resources from funds that would otherwise have gone to those districts. The formation of consortia to support area schools could help explain the number of consortia, the number of districts per consortium, and the relatively large awards to consortia. (There are about a thousand area schools in the country.) It might also help to explain state-to-state differences, as area schools and other intermediate agencies for vocational education are not equally concentrated in all states.

This conclusion is speculative, because detailed information on consortium operations does not currently exist. Additional research is needed to determine why and how consortia have been formed, what services they provide, how resources and services are apportioned among the consortium members, and the like. In consortia formed by large numbers of districts, how are "within district" concentration rules specified in legislation applied to consortium members? If consortia are operated by intermediate agencies (or area school districts) acting as fiscal agents, how are the federal requirements for apportioning shares of resources among LEAs and area schools in consortia applied?

Some of these questions will be explored in the next several months. At present, it appears that school districts that may have received individual awards in the past and that could have received funding individually, have instead joined consortia. In addition, a sizeable number of districts that were not identified as receiving Perkins support before are now also identified as members of consortia.

Table 2.7
Percentage of Local Basic Grant Funds Allocated to Secondary LEAs as a Function of Chapter I Rank and Total Student Enrollment, FY91–FY92

Quartile	Percent of FY92 Chapter I Allotment	Percent of FY92 Students	Percent of FY91 Basic Grant	Percent of FY92 Basic Grant	Percent of FY92 Districts
Lowest	17.1	25.0	22.6	19.8	65.0
Second	18.2	25.0	21.4	21.1	22.0
Third	21.0	23.3	22.5	21.7	9.9
Highest	42.8	26.7	33.4	37.4	3.2

NOTE: Districts ranked within state by size of Chapter I allocation, and split into quartiles by enrollment. Data based on 43 states. For FY91, funds include disabled and disadvantaged set-asides, adult set-aside, and program improvement.

Source: State Finance Record Collection

Findings about targeting on special population students. The introduction of a federally specified formula for allocations to secondary-level awardees appears to have increased somewhat the percentage of funds flowing to recipients with concentrations of disadvantaged students. Using Chapter 1 basic grant allocations as the indictor of disadvantage, local basic grant awardees (individual districts and consortia) were grouped into roughly equal quartiles based on student population. [23] As can be seen in Table 2.7, the 26.7 percent of students in the top quartile of Chapter 1 allocations were in districts (or consortia) that received 33.4 percent of local basic grant funds in FY91 and 37.4 percent of local basic grants in FY92.

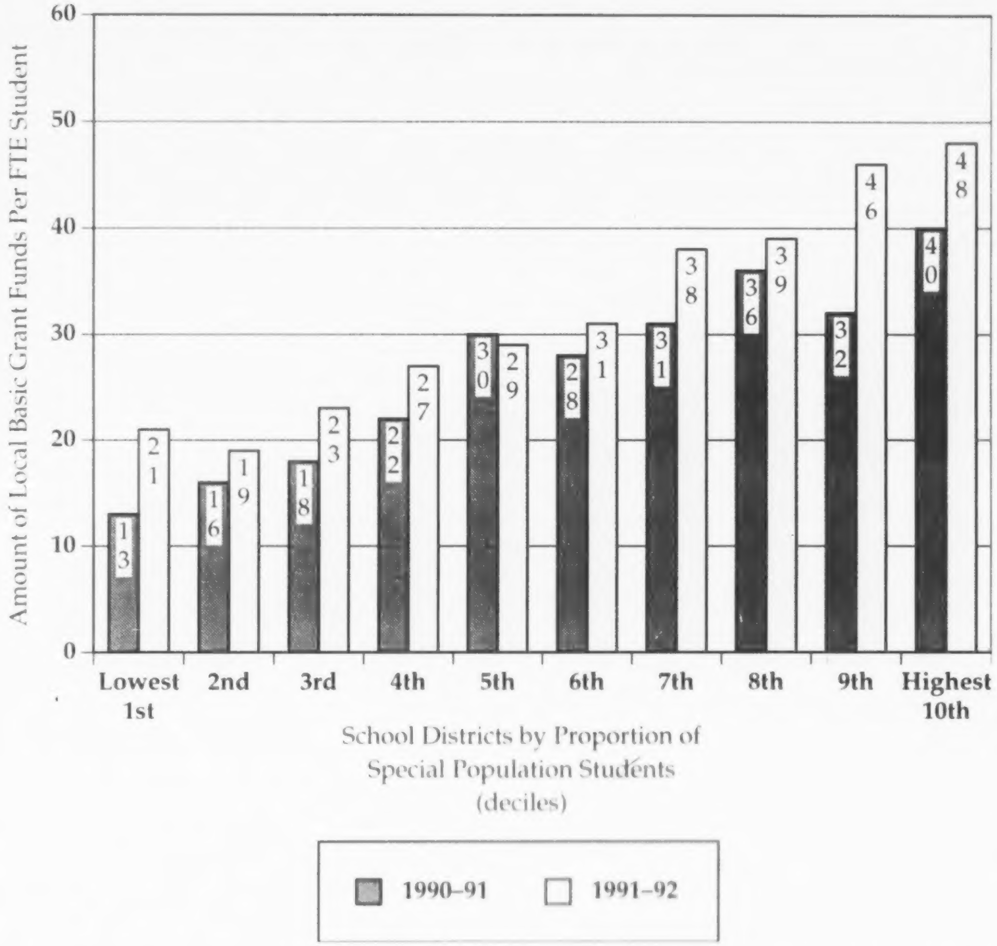
This suggests that districts with higher concentrations of students from poor families received somewhat larger per-student awards than other districts under the old legislation, and that the formula approach increased their share of allocations by about 11 percent (or $14.8 million, nationally). [24] Students in large districts with high proportions of disadvantaged students benefited from adoption of the formula, then, although their share of Chapter 1 funds remained greater than their share of vocational basic program funds (showing the effects of the other factors in the formula for secondary allocations).[25]

Preliminary analysis of data from the Omnibus Survey of regular school districts also show a relationship between a school district's grant size and its proportion of special population students, in both 1990–91 and 1991–92. When districts are arrayed in deciles based upon their proportions of special population students, the positive relationship between concentration of these students and amount of funding per FTE student is apparent (Figure 2.1) in both fiscal years. Further, for the 20 percent of districts with the highest concentrations of such students, the changes in the 1990 Act increase the per-pupil award substantially. However, the new formula also results in a substantial increase in funding for districts with some of the lowest proportions of special population students. In short, funds were already fairly well targeted on districts with high concentrations of special populations in FY91, and the targeting may have improved a little in FY92.

Basic Program Allocations: Funds Assigned to the Postsecondary Level

The intent of federal rules. The legislation refers to postsecondary education as "postsecondary/adult education." This means that the postsecondary level can encompass a wide range of institutions providing education and training — including community colleges, technical institutes, the adult programs of LEAs, the adult programs of area vocational facilities, and less-than-baccalaureate education provided by four-year postsecondary institutions. Across this range of institutions, federal rules seek to direct funds to institutions with concentrations of disadvantaged students through a formula that links an institution's receipt of funds to its percentage of all students in the state enrolled in vocational programs who received Pell Grants or assistance from the Bureau of Indian Affairs in the previous year.

Figure 2.1
Amount of Local Basic Grant Funds Per FTE Student,
Regular School Districts, FY91 and FY92:
Districts Ranked by Percent Special Population Students, Grades 9–12



NOTE: For FY91, funds include handicapped and disadvantaged set-asides, adult set-aside, and program improvement. Special population students include district-reported numbers of disabled and limited-English-proficient students, and those eligible for Chapter 1 and federally funded reduced-price or free lunch. There is some duplication across these counts.

Source: Omnibus Survey of School Districts

One potential problem in implementing the new formula is acknowledged in the legislation. The legislation allows states to petition to use an alternative formula by demonstrating that using the Pell Grant/BIA formula does not result in funds being distributed to institutions with the highest numbers of economically disadvantaged students. This is because receipt of Pell Grant is influenced by many institutional and individual factors other than a student's economic disadvantage.[26]

Although Congress established a minimum grant of $50,000 at the postsecondary level, this floor did not seem likely to have much impact. As early as FY87, the median Title II grant to a community college was $101,450 and the median grant to other awardees (i.e., postsecondary area schools, technical institutes, etc.) was $79,000 (unadjusted numbers). Factoring in increases in federal resources over time, one would predict that the effect of the new floor would not be large, and would probably occur primarily for providers other than community colleges.

General findings. For the 45 states for which data are available, the average local basic grant to postsecondary institutions (i.e., excluding sex equity and single parent grants), was $177,116 in the final year of the old legislation (see Table 2.2). In the first year of the 1990 Amendments, the average award rose to $223,922 an increase of 26.4 percent.[27] At the same time, the number of awards declined from 1,289 to 1,032, a drop of about 20 percent in the number of institutions funded. [28] This suggests that while the formula combined with the $50,000 floor may not have had a dramatic effect, it did have some impact. Postsecondary funds were concentrated on fewer institutions. Currently available data do not allow us to pinpoint which types of institutions were most affected.

At the postsecondary level, sex equity and single parent awards play a more important role than at the secondary level, so it is important to observe changes when those sources of funds are added. Further, the new Tech-Prep program under Title III tended to focus on postsecondary institutions, at least as fiscal agents for local consortia. When these three sources of support are added, it appears that the average postsecondary grantee received $266,070 in FY92.

Observing community college districts only, postsecondary awards under the new legislation shifted resources to colleges in urban areas (Table 2.8). In FY91, the average local basic grant award to a community college district in 56 cities with populations over 300,000 was $637,651; in FY92 it was $760,776 (for 57 cities). [29] Unlike the situation at the secondary level, where both large and small recipients gained resources, gains occurred in large urban areas (a 21.4 percent increase in funding, unadjusted) while community college districts in other areas of the same states experienced declines in funding (11 percent decline, unadjusted, on average). [30]

This difference with the secondary level, where (on average) all grantees received some funding increase between FY91 and FY92, was due, in large part, to the lack of any overall increase in funding to community colleges in the states between the two years. A few community college districts in large cities experienced

Table 2.8
Percent Change in Postsecondary Local Basic Grants to Community College Districts in Large Cities (1990 Populations >300,000), FY91 and FY92

City	State	1990 City Pop. (1,000s)	91 Basic Grant[a]	92 Basic Grant[a]	Percent Change District	Percent Change Rest of State	Percent Change State Overall
New York	NY	7,323	$3,151,645	$4,145,480	31.53%	-6.80%	7.81%
Los Angeles	CA	3,485	$2,549,356	$2,895,573	13.58	3.11	22.84
Chicago	IL	2,784	$1,900,233	$2,484,243	30.73	-17.17	-6.97
Houston	TX	1,631	$699,681	$613,896	-12.26	-14.01	-8.84
Philadelphia	PA	1,586	$621,637	$1,252,474	101.48	-22.36	-5.74
San Diego	CA	1,111	$1,321,091	$1,139,873	-13.72	3.11	22.84
Detroit	MI	1,028	$442,588	$1,037,270	134.36	-9.91	36.59
Dallas	TX	1,007	$2,166,227	$1,115,059	-48.53	-14.01	-8.84
Phoenix	AZ	983	$642,956	$342,632	-46.71	-82.63	-77.53
San Antonio	TX	936	$1,606,343	$2,306,344	43.58	-14.01	-8.84
San Jose	CA	782	$490,468	$604,376	23.22	3.11	22.84
Baltimore	MD	736	$436,943	$789,975	80.80	-4.86	9.05
Indianapolis	IN	731	$395,283	$705,510	78.48	-13.47	-7.64
San Francisco	CA	724	$1,322,801	$783,481	-40.77	3.11	22.84
Jacksonville	FL	635	$349,644	$406,600	16.29	7.24	13.88
Columbus	OH	633	$98,824	$100,269	1.46	-72.34	-35.26
Milwaukee	WI	628	$1,792,860	$1,528,325	-14.75	-3.15	-6.05
Memphis	TN	610	$408,050	$238,000	-41.67	-50.14	-49.80
Washington	DC	607	NA	NA	NA	NA	NA
Boston	MA	574	$313,233	$269,678	-13.90	21.15	16.79
Seattle	WA	516	$605,323	$751,169	24.09	37.10	51.60
El Paso	TX	515	$2,173,772	$2,820,357	29.74	-14.01	-8.84
Cleveland	OH	506	$139,346	$208,316	49.50	-72.34	-35.26
New Orleans	LA	497	$27,241	$783,161	2775.83	10.87	27.61
Nashville	TN	488	$191,300	$74,500	-61.06	-50.14	-49.80
Denver	CO	468	$148,129	$575,687	288.64	-10.31	-1.05
Austin	TX	466	$533,542	$889,594	66.73	-14.01	-8.84
Fort Worth	TX	448	$588,181	$840,237	42.85	-14.01	-8.84
Oklahoma City	OK	445	$3,050	$484,444	15,783.41	-38.09	75.89

(continued)

Table 2.8 (continued)
Percent Change in Postsecondary Local Basic Grants to Community College Districts in Large Cities (1990 Populations >300,000), FY91 and FY92

City	State	1990 City Pop. (1,000s)	91 Basic Grant[a]	92 Basic Grant[a]	Percent Change District	Percent Change Rest of State	Percent Change State Overall
Portland	OR	437	$686,483	$771,041	12.32%	36.70%	30.47%
Kansas City	MO	435	$1,042,990	$1,007,945	-3.36	-44.87	-29.37
Long Beach	CA	429	$430,988	$659,171	52.94	3.11	22.84
Tucson	AZ	405	$605,225	$170,860	-71.77	-82.63	-77.53
St. Louis	MO	397	$480,520	$1,080,585	120.72	-44.87	-29.37
Charlotte	NC	396	$119,915	$237,813	98.32	-5.84	-3.76
Atlanta	GA	394	$410,783	$324,218	-21.07	-10.70	-11.12
Virginia Beach	VA	393	NA	NA	NA	NA	NA
Albuquerque	NM	385	$622,597	$810,168	30.13	-10.83	-5.24
Oakland	CA	372	$745,556	$811,469	8.84	3.11	22.84
Pittsburgh	PA	370	$934,179	$1,582,277	69.38	-22.36	-5.74
Sacramento	CA	369	$902,955	$1,059,090	17.29	3.11	22.84
Minneapolis	MN	368	$715,788	$672,296	-6.08	-3.87	-4.04
Tulsa	OK	367	$0	$231,752	NA	-38.09	75.89
Honolulu	HI	365	NA	NA	NA	NA	NA
Cincinnati	OH	364	$195,802	$200,000	2.14	-72.34	-35.26
Miami	FL	359	$1,177,022	$1,979,953	68.22	7.24	13.88
Fresno	CA	354	$831,176	$973,854	17.17	3.11	22.84
Omaha	NE	336	$220,218	$608,196	176.18	5.34	26.83
Toledo	OH	333	$75,629	$66,917	-11.52	-72.34	-35.26
Buffalo	NY	328	$390,883	$606,951	55.28	-6.80	7.81
Wichita	KS	304	NA	NA	NA	NA	NA
Total			$35,708,457	$43,364,251			
Average Award			$637,651	$760,776	21.44%	-11.05%	-0.64%

[a] FY91 funds do not include sex equity and single-parent set-asides. FY92 funds are basic grants only. TN and TX use FY93 data.

Sources: 1992 Statistical Abstract; 1992 AACJC Community, Technical, and Junior Colleges Statistical Yearbook. Award Data Source: State Finance Record Collection funding declines either absolutely or in relation to other colleges in their states. These were due both to having received larger grants in the past compared to what they would have received under the formula (i.e., they did not have sufficient Pell Grant recipients enrolled in vocational education to maintain their grant levels) or because the state chose to shift resources away from postsecondary education overall (or for both reasons).

Ten states adopted alternative funds distribution formulas for postsecondary awards in the first year of the new legislation. Most of those states appear to have used Pell Grants as one factor, but augmented the count of Pell recipients with counts of JTPA participants, and/or recipients of various forms of campus-based aid. At least two of the states with alternative formulas awarded 15 percent or less to postsecondary education.

Findings about funds targeting on disadvantaged students. There is preliminary evidence that the combination of the Pell Grant-BIA formula and the $50,000 award floor directed more resources to institutions with larger numbers of Pell Grant recipients enrolled in vocational programs. Within each state, institutions receiving funds in both FY91 and FY92 were ranked with respect to the numbers of Pell Grant recipients enrolled in vocational education in FY92 (Table 2.9). Taken as a whole, institutions above each state's median (with respect to absolute numbers of Pell Grant recipients in occupational programs) received 77 percent of the postsecondary local basic grant funds in FY92, compared with 68 percent in FY91. Because institutions that did not receive awards in FY92 were excluded from the analysis, this finding probably understates the increase in concentration of funds among institutions with higher numbers of Pell Grant recipients in vocational programs.

At the postsecondary level there is also the possibility that differences in the definition of who is counted in the formula can affect our ability to measure the law's impact. Unlike the secondary formula, the formula for postsecondary institutions is based on numbers of disadvantaged persons (i.e., Pell Grant recipients) enrolled in vocational or occupational programs. There are no precise federal definitions, however, of which postsecondary programs should be included or which students should be counted. This means that states or individual institutions may either establish definitions of occupational programs and/or students or take no action to further define the concepts. When a state takes no action, it is possible that individual institutions will count varying numbers of Pell Grant recipients based on the institution's formal definitions or on informal protocols they adopt to count students.

Data from the Omnibus Surveys also show a relation between the proportions of special population students in public non-baccalaureate postsecondary institutions and the amount of local basic grant funds the institutions receive

Table 2.9
Percent of Federal Vocational Postsecondary Local Basic Grants Allocated to Institutions Above State Median Pell Enrollment, FY91–FY92

	Share of Postsecondary Local Basic Grants	
Institutions where number of Pell recipients is:	FY91	FY92
Above the state median	68%	77%
Below the state median	32%	23%

Note: Includes only institutions reporting FY92 Pell recipients. Based on 40 states.
FY91 funds do not include sex equity and single parent set-asides. FY92 funds are basic program only.

Source: State Finance Record Collection

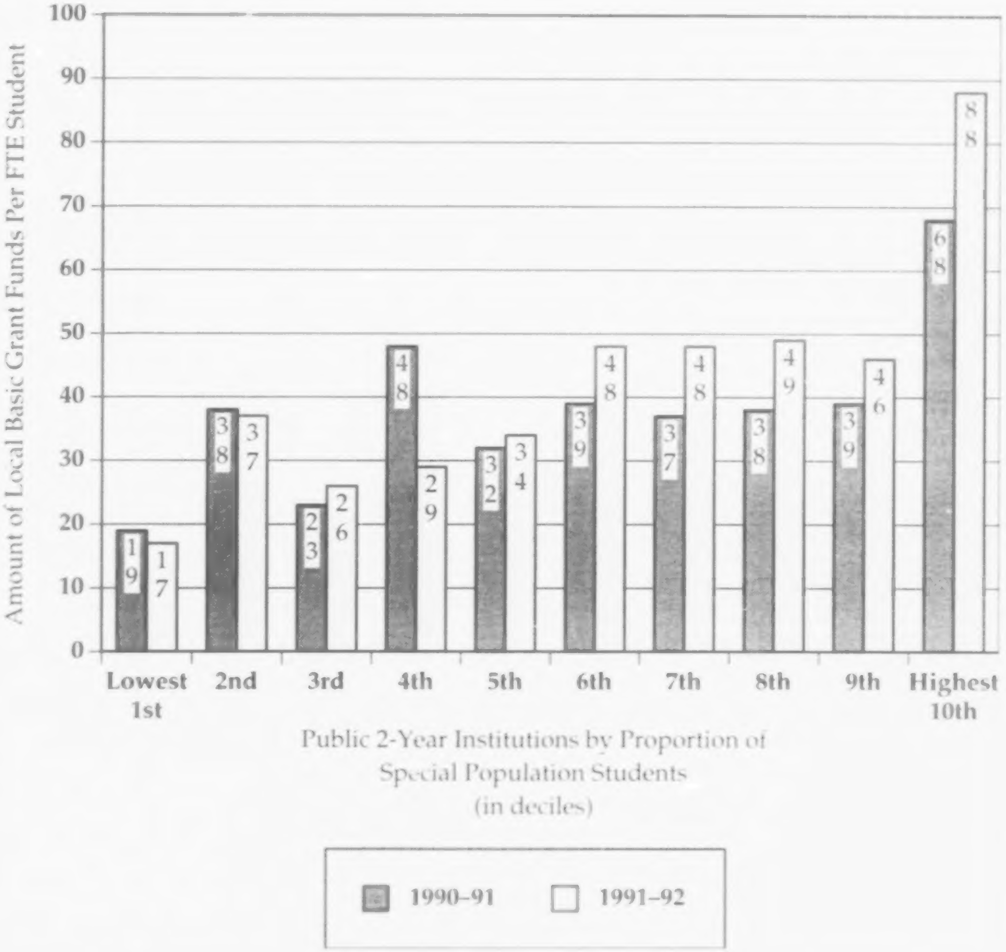
(Figure 2.2). The relationship is somewhat uneven but appears to be stronger in FY92 than in FY91. Thus, the Omnibus Survey data also suggest that targeting on special populations in postsecondary institutions improved somewhat between FY91 and FY92.

More generally, the data in this section and the previous one show that Perkins local basic grant funds to postsecondary institutions were concentrated among fewer recipients, shifted more toward urban areas, and were somewhat better targeted on special populations in FY92 than in FY91, all consistent with the intentions of the 1990 Perkins Act.

Basic Program Allocations: The Roles of the Interstate Formula and the Secondary/Postsecondary Shares

Most of the discussion in this chapter has focused on the formulas for distribution of funds within each sector (secondary and postsecondary), but it is important to keep the effects of the within-sector formulas in perspective. Findings cited earlier on allocations to secondary grantees in large cities show that places of comparable economic need in different states often receive very different per-student allocations. In small part, these difference may be due to Chapter 1 formula considerations. [31] However, these differences are more likely due to how much money their respective states receive through the interstate formula of the Perkins Act, and their within-state decisions on shares of funds for secondary and postsecondary levels.

Figure 2.2
Amount of Local Basic Grants Funds Per FTE Student, Postsecondary Institutions, FY91 and FY92: Institutions Ranked by Percent Special Population Students



NOTE: For FY91, funds include handicapped and disadvantaged set-asides, adult set-aside, and program improvement. Special population students include institution-reported numbers of Pell Grant recipients, recipients of BIA assistance, disabled students, and limited-English-proficient students.

Source: Omnibus Survey of Postsecondary Institutions

To see the importance of the interstate formula and secondary/postsecondary share decisions in determining allocations to eligible recipients, we can compare two cities with similarly high poverty rates. Table 2.10 shows that the Oakland, CA school district, in a city with a poverty rate among children ages 5–17 of 29.1 percent, received $12.50 in basic grant funds per student in grades 9–12 in FY92. The Philadelphia, PA, school district, in a city with a poverty rate of 29.2 percent, received $29.20 per student in grades 9–12.

Why the disparity? First, California received a relatively low per-student allotment of all federal funds under the interstate formula — approximately $20.97 per person, for persons ages 15–24. Pennsylvania received more, $24.77 per person, ages 15–24, which put Pennsylvania only slightly below the national interstate allotment average of $25.13 per person, ages 15–24. [32] Then, California chose to allocate about 45 percent of its local basic program funds to secondary education, while Pennsylvania allocated approximately 71 percent to secondary education. These interstate allotment formula differences and sector allocation choice differences combine to lead to widely different per-student allocations available to secondary education even before the intrastate formulas are applied.

CONCLUSION

With respect to the shares of resources for secondary and postsecondary/adult sectors, the change from the 1984 to 1990 legislation results in a small decline in basic grant allocations to the postsecondary sector. When other parts of Titles II and III are added to the analysis, the decline appears smaller. The range of allocations among states continues to be rather broad, with most states awarding between 10 and 60 percent of basic grant funds to the postsecondary sector in FY92. Over the past six years, there has been little change, nationally, in the percentages of funds awarded to the postsecondary sector — it hovers at between 38 and 40 percent.

As for within-sector allocations, at the secondary level there have been substantial changes in average awards and numbers of awards between the old and new legislation. Average local basic grant awards have more than doubled, and the number of awards has been cut almost in half. Under the new legislation, funds are more concentrated in urban areas, although all secondary recipients have experienced some increase in funding. The legislation has also resulted in the formation of large numbers of consortia composed of multiple districts, with average awards larger than awards to individual school districts. Thus, many more districts participated in basic grant funds in FY92 than in FY91. The change from the old to new legislation has resulted in somewhat greater targeting of funds on districts with large numbers of special population students, consistent with the intent of the 1990 Perkins Act.

At the postsecondary level, the new legislation has also brought about change, though not nearly as dramatic as at the secondary level. Average basic program

Table 2.10
FY92 Local Basic Grants (LBG) to Large Cities in States with Two or More Large Cities

City	State	Perkins Formula Factors			FY92 LBG	LBG $ per Student	Ratio--Percent of Chapter 1 Funds to Percent of Enrollment
		District Percentage Share of Total State:					
		Chap. 1 Funds	IEP Enroll.	Enroll-ment			
Phoenix	AZ	26.4%	20.5%	18.6%	$1,377,834	$64.8	1.4
Tucson	AZ	13.5	11.6	12.4	$732,722	$12.0	1.1
Los Angeles	CA	20.2	13.6	13.2	$4,911,198	$7.5	1.5
San Diego	CA	3.2	3.2	2.4	$849,059	$7.2	1.4
Long Beach	CA	3.0	1.2	1.4	$659,441	$9.8	2.2
Fresno	CA	2.7	1.7	1.4	$645,631	$9.5	2.0
Oakland	CA	2.8	1.1	1.0	$626,774	$12.5	2.8
San Francisco	CA	2.5	0.0	1.2	$504,771	$8.2	2.0
Sacramento	CA	1.7	1.2	1.0	$411,679	$8.6	1.8
San Jose	CA	0.6	0.7	0.6	$163,117	$5.7	1.0
Miami	FL	21.0	12.0	15.7	$2,676,769	$9.4	1.3
Jacksonville	FL	7.7	7.8	6.0	$1,086,612	$10.1	1.3
St. Louis	MO	21.6	6.9	5.8	$1,456,042	$30.2	3.7
Kansas City	MO	10.5	4.4	5.2	$749,791	$17.4	2.0
New York	NY	95.6	39.2	39.6	$11,824,628	$9.8	2.4
Buffalo	NY	4.4	1.9	2.0	$556,564	$9.4	2.3
Cleveland	OH	12.3	4.0	3.9	$2,362,072	$29.7	3.1
Columbus	OH	7.3	4.8	4.8	$1,587,010	$16.4	1.5
Cincinnati	OH	6.7	2.5	2.7	$1,317,575	$24.4	2.5
Toledo	OH	4.3	2.3	2.3	$895,025	$19.2	1.9
Oklahoma City	OK	10.0	9.7	6.3	$738,890	$20.3	1.6
Tulsa	OK	8.8	7.7	7.2	$692,871	$16.6	1.2
Philadelphia	PA	30.2	13.0	11.7	$5,675,263	$29.2	2.6

(continued)

Table 2.10 (continued)
FY92 Local Basic Grants (LBG) to Large Cities in States with Two or More Large Cities

		Perkins Formula Factors					
		District Percentage Share of Total State:					
City	State	Chap. 1 Funds	IEP Enroll.	Enrollment	FY92 LBG	LBG $ per Student	Ratio--Percent of Chapter 1 Funds to Percent of Enrollment
Pittsburgh	PA	4.9	2.5	2.4	$957,932	$23.6	2.0
Memphis	TN	22.1	9.3	13.3	$2,282,614	$19.3	1.7
Nashville	TN	7.4	7.3	8.2	$907,861	$12.5	0.9
Houston	TX	7.8%	5.1%	5.6%	$2,021,400	$10.2	1.4
Dallas	TX	5.9	2.7	3.9	$1,433,331	$10.2	1.5
San Antonio	TX	4.7	1.6	1.7	$1,072,830	$17.8	2.8
El Paso	TX	3.6	1.5	1.8	$826,269	$12.8	2.0
Fort Worth	TX	2.4	1.8	2.0	$641,024	$8.8	1.2
Austin	TX	1.7	2.0	2.0	$486,730	$7.0	0.8

Source: State Finance Record Collection

awards have also increased, and the number of grantees has declined by about 20 percent. Observing only community colleges, it appears that funds are now more concentrated in urban areas, but that in other areas of the same states there has been no funding increase. Evidence also points to better targeting of funds on institutions with larger numbers of special population students. Both the concentration of funds among fewer institutions and the improved targeting are consistent with the intent of the new Perkins Act.

Finally, it is critical to remember the importance of the interstate allocation formulas and state decisions on secondary and postsecondary shares in determining actual allocations. An example is provided of city school districts with roughly similar economic need among students, located in states with different allotments and sector share decisions. In one district the resulting per-pupil dollars are over twice the amount in the other.

ENDNOTES

[1] See Muraskin, L.D. (1989), *The Implementation of the Carl D. Perkins Act: National Assessment of Vocational Education*, Final Report, Vol. II, Washington, DC: U.S. Department of Education; also see Millsap, M.A., et al. (1989), *State and Local Response to the Carl D. Perkins Act: Case Study Analysis Final Report*, Cambridge, MA: Abt Associates; and Millsap, M.A., & Muraskin, L.D., *Federal Vocational Policy in the U.S.*, in Husen, T. and Postelthwaite, T.N., eds. (in press), *International Encyclopedia of Education*, Oxford, England, Pergammon Press.

[2] While special populations include those groups of students listed, the formula is weighted by only disadvantaged students, disabled students, and the number of students at the secondary level and by only disadvantaged students at the postsecondary level.

[3] This formula is reviewed in Barro, S.M. (1994), *The Interstate Distribution of Federal Funds for Vocational Education*, Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

[4] Barro, S.M. (1992), Design for the Congressionally Mandated Study of the Formula for Distributing Federal Vocational Education Funds to the States. *Papers Presented at the Design Conference for the National Assessment of Vocational Education.* Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

[5] This section is based on an assessment of the intrastate fund allocation provisions in Barro, S. M. and Muraskin, L.D. (1994), *The Within-State Distribution of Federal Vocational Education Funds*, Washington, DC.

[6] The single parent, displaced homemaker, and single pregnant woman programs will be referred to as the single parent program in this chapter.

[7] The rule also asks states to estimate the distribution of the 1 percent for programs for criminal offenders to corrections agencies.

[8] Given the $15,000 minimum grant, it is unclear why this provision is included. Presumably, districts would only receive smaller grants as part of consortia, but consortia are largely prohibited from making subgrants back to LEAs to operate separate projects. The only possible cases in which grants smaller than $15,000 are possible are when states waive the minimum grant for rural LEAs in sparsely populated areas.

[9] These data will be reported in Klein, S., Hoachlander, E.G., Tebben, C., & Premo, M. (1993), *State Allocation of Basic Grant Funds: A Comparison of the Carl D. Perkins Acts of 1984 and 1990.* Draft Report Prepared for the National Assessment of Vocational Education. Berkeley, CA: MPR Associates. This document will also describe the methodology of the study.

[10] National Assessment of Vocational Education, Omnibus Surveys of Regular School Districts, Versions A and B, 1992. The data from these surveys were analyzed by Duc Lee To, a member of the National Assessment staff.

[11] It was also a period in which regulations on allocations, even proposed rules, had not yet been issued.

[12] The basic program is the portion (about 75 percent) of basic grant funds that is distributed through the just-described formulas for secondary and postsecondary/adult sectors.

[13] To make the comparison with allocations under the former legislation consistent, portions of previous basic grant awards that are not part of the basic program (i.e., sex equity and single parent/homemaker awards) were omitted from the FY91 award data in Table 2.2.

[14] National Center for Education Statistics (1988), *Policies Concerning Vocational Education*, Survey Report (NCES 89-420), Washington, DC: U.S. Department of Education. The number receiving waivers is unknown. Two of the states with low postsecondary award averages report average grants to individual postsecondary institutions below the $50K minimum. At least one of the states providing almost all funds to postsecondary shows very few school districts receiving awards of any kind (suggesting that it, too, received a waiver).

[15] In 1986–87, for example, about two-thirds of the postsecondary institutions receiving any support under the basic grant received single parent funds, compared with only 8 percent of regular secondary school districts receiving support (Muraskin, 1989).

[16] Not all Tech–Prep funds shown in awards to postsecondary providers are spent at postsecondary institutions, however. Grantees are fiscal agents for consortia of school districts and postsecondary institutions.

[17] National Center for Education Statistics, op. cit.

[18] Muraskin (1989). The FY87 local survey data may understate postsecondary awards because some awards to school districts for postsecondary programs may have been included in the adult set-aside. Data for the adult set-aside were not considered reliable.

[19] The average awards for both years exclude sex equity and single parent grants. No data are adjusted for changes in the size of the basic grant between years or for inflation. These award data reflect allocations to recipients, not expenditures.

[20] Data are not adjusted for year-to-year changes in the size of the basic grant or for inflation.

[21] The information on region and student composition was obtained from the National Assessment Omnibus Survey of Regular School Districts. All other data in this section of the chapter are from Klein, et al. (1993).

[22] No adjustments for year-to-year changes in the size of the basic grant or inflation have been made.

[23] In three additional cities there were declines relative to other districts in the state, but not absolute declines.

[24] Klein, et al. (1993). There were some cities for which data were not available for one or both years. In particular, some cities appear to have joined consortia and do not have individual data for FY92.

[25] In other words, the lowest quartile of students were in districts with the lowest Chapter 1 allocations.

[26] Overall, the increase in federal funds to secondary programs was about $30 million over the period. Dollar figures are not adjusted.

[27] Because the analysis uses absolute Chapter 1 allocation rather than Chapter 1 allocation relative to student population (or a direct district poverty indicator), it does not tell us whether districts (or consortia) with the largest proportions of disadvantaged students also benefited from the introduction of the formula.

[28] Barro & Muraskin, op. cit.

[29] Two states show average awards under $50,000, both of them states contributing less than 15 percent of all basic program funds to postsecondary education. These data are not adjusted for changes in the overall size of the basic grant or for inflation. No figures are adjusted for changes in the size of the basic grant.

[30] There is no consortium provision in the legislation for postsecondary awards.

[31] Unadjusted figure.

[32] Overall, the states in which these cities were located experienced a very slight decline in support to community colleges — .64 of a percent. The finding that the increase between FY91 and FY92 in basic grant funding to community colleges is 21.4 percent, while that for all postsecondary institutions is 26.4 percent requires further investigation. It may be due in part to factors such as the number and characteristics of states reporting the data.

[33] States may have different ways of counting poverty (e.g., some states factor in AFDC receipt) or they could be due to the effects of hold harmless provisions (although this would have been unlikely for FY92).

[34] Issues of interstate funds distribution are discussed in Barro, op. cit.

CHAPTER 3

THE STATE ADMINISTRATION OF THE PERKINS ACT

INTRODUCTION

The Perkins Act calls upon the National Assessment of Vocational Education to describe and evaluate

> the effect of this Act on State and tribal administration of vocational education programs and on local vocational education practices, including the capacity of State, tribal, and local vocational education systems to address the priorities identified in this Act.[1]

This chapter addresses major elements of this mandate. In particular it examines changes in Perkins funding for state administration, as well as changes in staffing levels, workloads, and priorities. It also examines federal assistance to states in implementing provisions of the Act, and state support for localities. This inquiry finds that the capacity of secondary state agencies to assist with implementation has declined in some areas. However, it is not possible to determine whether this decline is a direct result of reductions in Perkins funding for state administration.

The effects of the Act on local practices are touched upon in this chapter, but are dealt with in more detail later in the report. The relation between the Perkins Act and vocational education in tribal institutions will be examined in the Assessment's Final Report to Congress.

During the reauthorization of the Perkins Act, many legislators raised questions about the role of the states in implementing the Act. In general, they agreed that states should play a major role in managing its implementation and in carrying out regulatory responsibilities. But beyond these functions, there was disagreement about what states should do. The 1984 Perkins Act allowed states to use Title II funds for technical assistance to localities. However, some educational groups representing local interests expressed the concern that states might use these funds for statewide activities to a greater extent than the law intended. In response, the 1990 Perkins Act clarified the role of the state, reduced the maximum proportion of Perkins funds for state administration from 7 percent to 5 percent, and effectively reduced the proportion of funds for statewide projects from 13 percent to 8.5 percent. These changes ensured that a greater portion of the Perkins funds would be directed to local programs and used at the discretion of local authorities.

While the full impact of the Perkins Act on state administration is still being explored, two immediate questions arise: First, could state vocational offices keep the same number of staff and, further, would it be necessary for them to do so? As we know, many states are experiencing budget problems and are unlikely to make up the loss of Perkins funds from other sources. Second, if states have to cut back their staff functions, which activities should they emphasize and which should they forego?

Other questions follow from these: Do states receive adequate support and assistance from the federal government? Do States provide adequate leadership and technical assistance for localities in implementing provisions in the 1990 Act? We turn to data from the Omnibus Surveys to answer these and related questions.

Funding and Staffing

As indicated above, the 1990 Act reduced the maximum proportion of Perkins funds available for state administration from 7 percent to 5 percent. The typical (median) state received $14.7 million in Perkins funds in 1991–92, up from $14.0 million in 1990–91. (See Appendix Table A-3.1.) Despite the overall increase in Perkins funding, the median amount allocated to state administration declined from $979,613 in 1990–91 to $629,499 in 1991–92.[2]

The median funds for both secondary and postsecondary state administration declined by 28 percent. However, only secondary state offices shrank; postsecondary offices remained the same size (see Table 3.1). The median number of full-time employees in secondary state offices was reduced from 36 to 28 in the 1990–1992 period, a net loss of 8 workers. This substantial reduction seems to have started in 1990, the year in which the Perkins Act became law. During the period of 1987–90, staff size remained roughly the same, about 37 FTE workers.

Since both state offices (secondary and postsecondary) experienced the same rate of reduction in Perkins funds, it is not clear why the median staff size of the postsecondary offices remained stable at 25 FTE workers. One possible reason is that the functions of postsecondary state agencies are more diversified, and so are their funding sources. As Table 3.1 shows, about 85 percent of the staff in secondary agencies spend most of their time on vocational education, but in postsecondary offices only 35 percent of the staff work primarily on vocational education.

The reduction of staff in secondary agencies seems to have increased the workload of the remaining staff because staff members now manage more resources. Between 1990–91 and 1991–92, the median operating budget per FTE employee increased from $407,510 to $611,329, a 21 percent increase.

Table 3.1
State Employees, Budget Per Employee, and Assignments, by Year

	Secondary Voc. Ed. Agency	Postsecondary Voc. Ed. Agency
Median Number of FTE Employees		
1987	37.5	23.5
1990	36.0	25.0
1992	28.0	25.0
Median Operating Budget Per FTE Employee		
1990–91	$407,510	$965,200
1991–92	$611,329	$1,110,446
Growth rate (percent)	21.0	6.1
Median Percent of Employees Who Spend Most of Their Time on Vocational Education		
1987	85.0	35.0
1990	85.0	37.5
1992	85.5	35.0
Median Percent of Employees with Major Job Shift, 1990 to 1992	10.0	3.5

Source: Omnibus Surveys of Secondary and Postsecondary State Agencies

Shift of Staff Functions

States with reduced staffs have two options: (a) increase the workload of the remaining staff or/and (b) shift the functions of the remaining staff by reassigning them to high priority programs and activities. To explore further what state offices have done to deal with staff reductions, we classified secondary offices into three groups: (a) those that experienced more than 15 percent reduction in staff (high-reduction offices); (b) those that experienced a reduction rate less than 15 percent (low-reduction offices); and (c) those that experienced no change or an increase in staff size (no-reduction offices). The same methodology is applied to postsecondary offices except that the 15 percent benchmark is replaced by 10 percent.[3]

The profiles of these three groups of staff secondary and postsecondary offices are shown in Table 3.2. From these profiles, we found three patterns for both secondary and postsecondary offices:

(1) State offices that experienced large staff reductions tend to have larger proportions of staff working primarily on vocational education.

(2) The budget-per-worker increase was larger for offices that experienced large personnel cuts than for those with smaller cuts. If per-worker budget is a good measure of changes in staff workload, the data indicate that offices with large personnel cuts tend to increase staff workload more than others. As Table 3.2 shows, "high-reduction" offices that lost 15 percent (or 10%) of their staff increased staff workload by 38 percent.

(3) State offices that had substantial staff reductions also had larger proportions of staff experiencing major job shifts over the past two years. The proportion of staff experiencing major job shifts did not differ much in states with smaller staff cuts and in states in which staff size had not changed or increased. Therefore, despite the fact that many States are forced to work with smaller staffs, only those that experienced high levels of staff reduction (more than 15%) make substantial adjustments in their staffs' job functions.

Secondary state offices that experienced substantial staff reductions had relatively large workloads — $833,300 as compared with $247,300 for those that had no reduction or experienced an expansion in staff. The larger workload for this group could worsen the equity of workload distribution among state secondary offices. It could also cause problems for implementing the Perkins Act, because there may be fewer staff members to oversee implementation. Postsecondary state offices do not show this pattern, however.

A strong relationship between secondary staff reductions from 1990 to 1992, increases in workloads, and percentages of employees experiencing major job shifts is apparent in Table 3.2 and Appendix Table A-3.2. It seems that secondary state offices, facing substantial increases in workloads due to staff reductions, are forced to cut back some activities and reassign staff to tasks with higher priorities. Whether these adjustments have affected the implementation of the Perkins Act is an issue that will be addressed later in this chapter. Postsecondary state offices that reduced their staff substantially were also more likely than

Table 3.2
State Employees, Budget Per Worker, and Assignments, by Type of Office, 1987, 1990, 1992

	Secondary Office			Postsecondary Office		
	High Reduction	Low Reduction	No Reduction	High Reduction	Low Reduction	No Reduction
Median FTE employees in 1992	28	34	28	45	25	22
Growth rate 1990–92(%)	-25	-6	0	-19	-1	15
Growth rate 1987–90(%)	0	1	0	0	5	6
Median operating budget in FY92 (in $million)	$28.4	$24.6	$15.5	$13.9	$38.4	$43.4
Growth rate FY91–FY92 (%)	2	5	3	0	7	3
Median budget per FTE worker in FY92 (in $1,000)	$833.3	$311.8	$247.3	$659.4	$1,321.4	$1,378.1
Growth rate FY91–FY92 (%)	38	12	0	37	9	-11
Median percent of employees spending most of their time on vocational education (1992)	100	85	55	44	35	29
Percent of employees who experienced major job shift in 1990–92	20	10	10	16	5	5

Source: Omnibus Surveys of Secondary and Postsecondary State Agencies

others to shift staff assignments, although this change was unrelated to changes in workload.

Figures 3.1 and 3.2 show how staff responsibilities changed between 1990–91 and 1991–92. (Also see Appendix Tables A-3.3 and A-3.4.) Clearly, both secondary and postsecondary offices have raised the priority of developing performance measures and serving special populations, consistent with the emphases of the Perkins Act.

Developing better business/labor partnerships, distributing and monitoring funds, collecting data, and providing training and technical assistance to localities are also emphasized in both types of offices. Postsecondary agencies emphasize data collection more, and secondary offices are more concerned about developing business/labor partnerships and monitoring funds. For both offices, technical assistance to localities is emphasized but is not the highest priority.

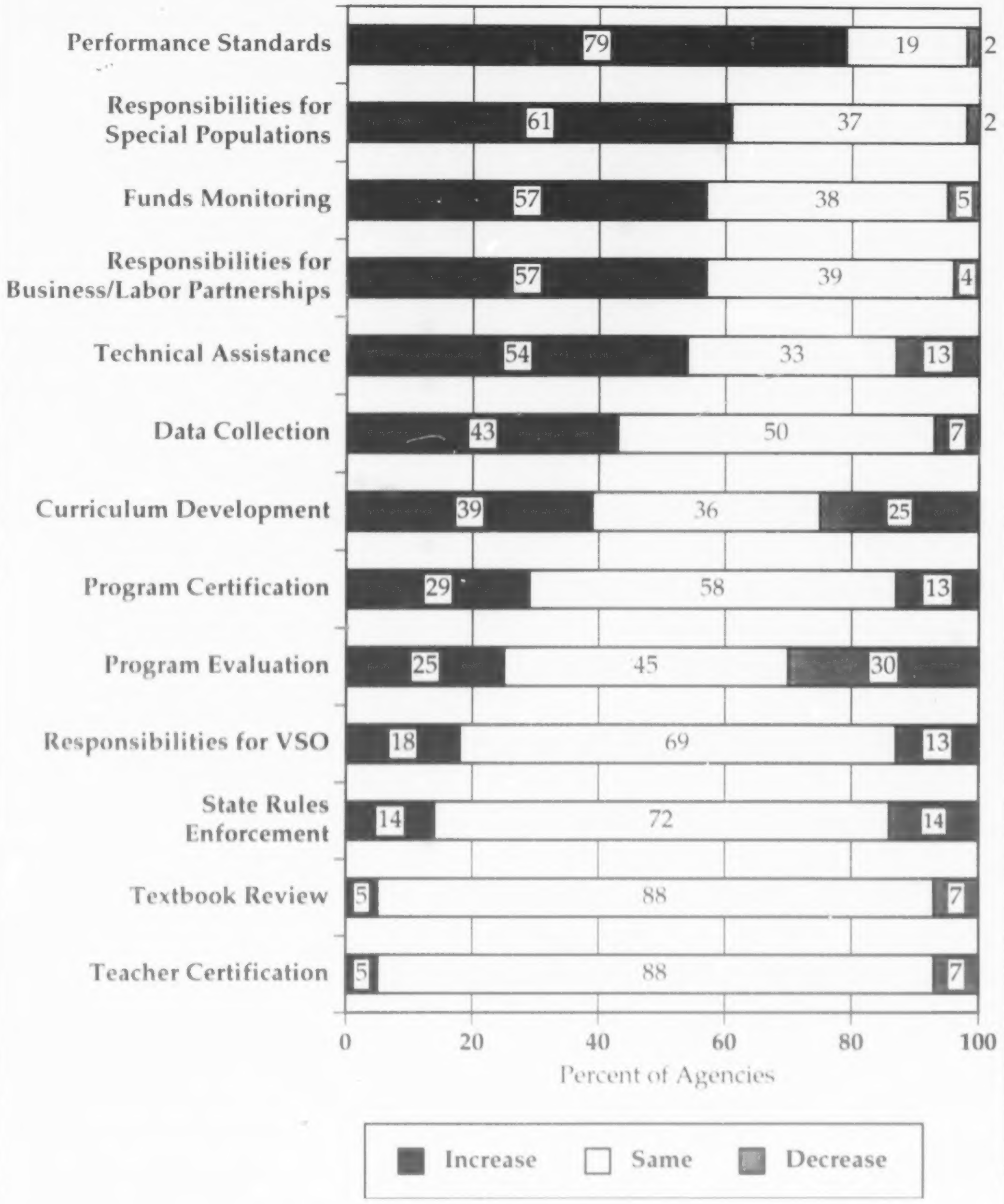
Curriculum development and evaluation of local programs get the least emphasis, relative to other activities. Of course, the evaluation of local programs under Perkins must await the implementation of the new standards and measures at the local level (see Chapter 11).

As we have seen, state offices that experienced large staff reductions tended to reassign staff to different jobs. To what kinds of jobs were they reassigned? One way to find out is to see how staff responsibilities in these high-reduction offices changed between 1990–91 and 1991–92 and compare the changes with those in low-reduction offices. Appendix Figures A-3.1 and A-3.2 and Table A-3.5 show these changes.

In secondary agencies, high-reduction offices were more likely than those with little or no reduction to report decreases, or smaller increases, in the following activities: (a) curriculum development, (b) technical assistance, (c) funds monitoring, (d) program evaluation, (e) responsibilities concerning special populations and (f) responsibilities concerning vocational student organizations (VSOs).

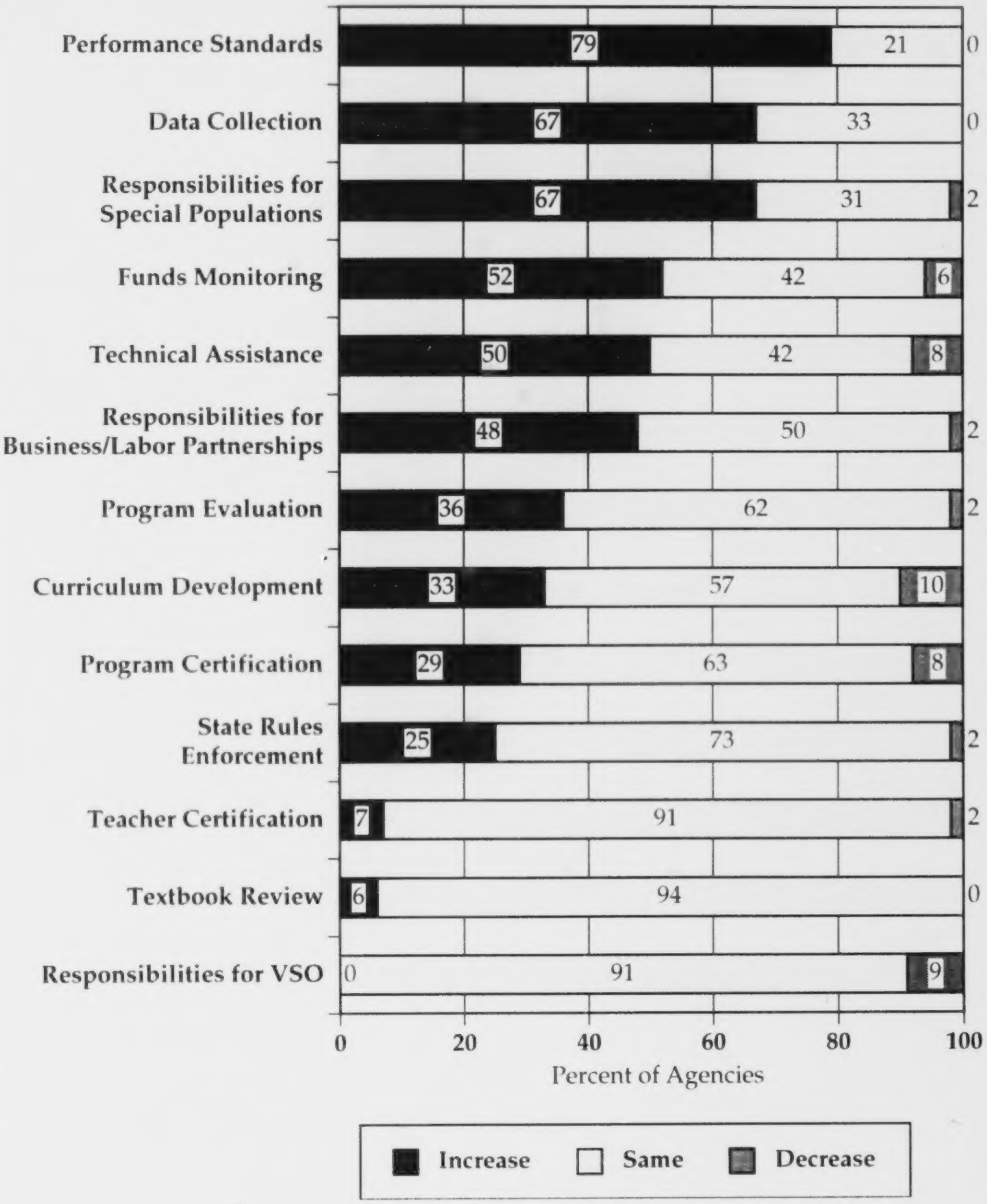
Two activities became much more important regardless of the size of staff cuts: (a) development of student performance standards and (b) responsibilities concerning business/labor partnerships. Further, we have already seen that all offices have taken more responsibility for serving special populations and distributing and monitoring funds. However, as offices experience more severe cuts in staff size, they seem to cut back on these activities. Fewer high-reduction offices than low-reduction offices reported an increase in staff responsibilities for these activities.

Figure 3.1
Changes in Staff Responsibilities at Secondary State Agencies



Source: Omnibus Survey of Secondary State Agencies

Figure 3.2
Changes in Responsibilities at Postsecondary State Agencies



Source: Omnibus Survey of Postsecondary State Agencies

Postsecondary offices show a clear tendency to take on more responsibilities, especially if their staff size is not reduced. This pattern is evident in 9 of 13 categories of activity.

In summary, Perkins funds for state administration of vocational education decreased between 1990–91 and 1991–92. At the same time, the staff size of secondary state offices decreased and the workload increased. Facing increased workloads, state offices experiencing substantial staff reductions reassigned remaining staff to high-priority activities such as the development of performance standards and activities for special populations, while reducing the priority of activities such as curriculum development and local program evaluation. Nevertheless, as offices experienced more severe cuts in staff size, they seemed to hold back on activities for special populations. This raises a concern about whether substantial staff reductions in some state offices are reducing their ability to implement some provisions of the Perkins Act.

For postsecondary state offices, changes are less evident. Most offices were able to maintain their staff size, workloads increased less, and fewer staff were reassigned than at the secondary level. Nevertheless, postsecondary offices that experienced staff reductions were less able than others to increase their level of activity.

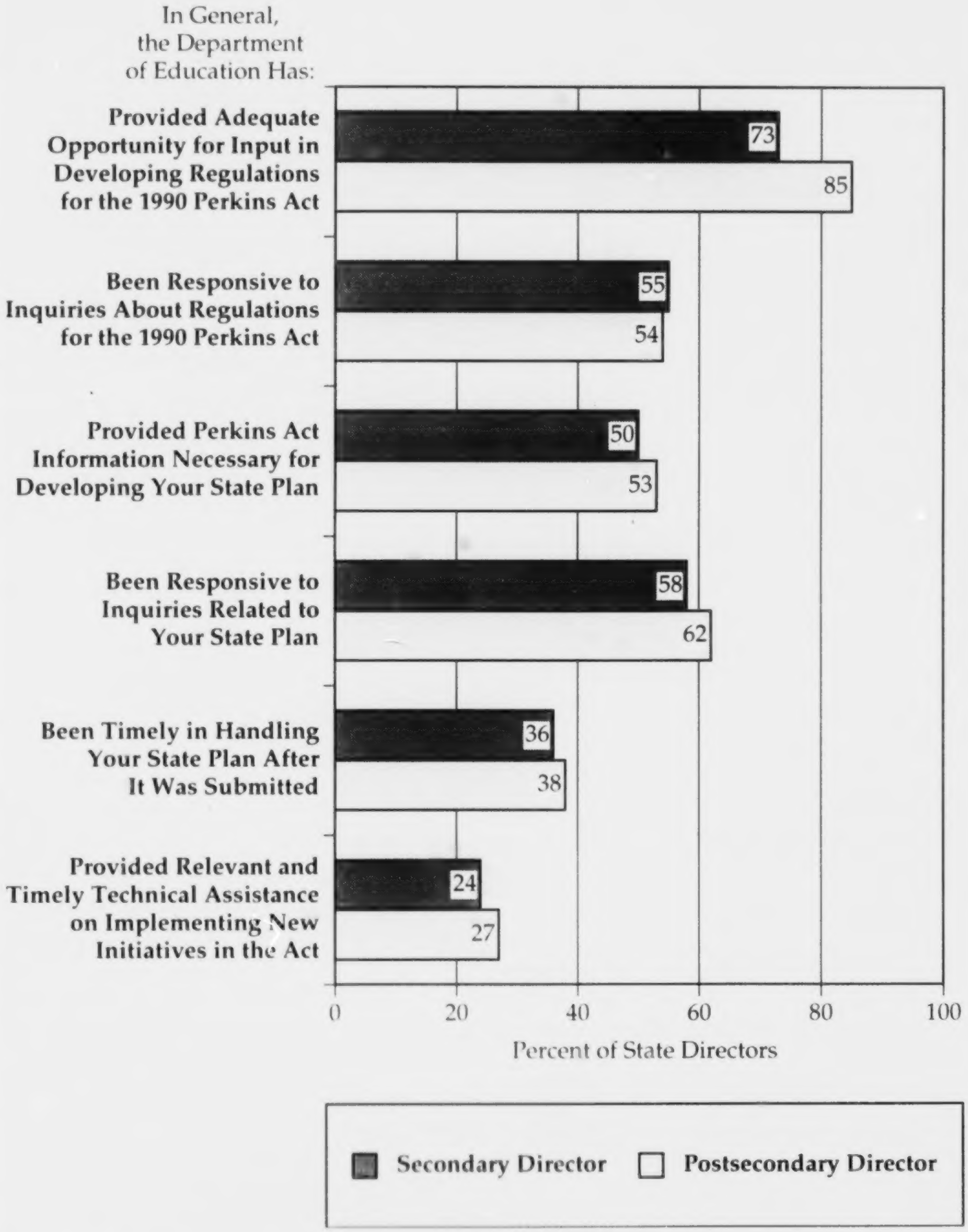
INTERACTIONS BETWEEN THE FEDERAL GOVERNMENT, STATES, AND LOCALITIES

In the process of applying for and receiving Perkins funds, states must interact with the federal government. The government is expected to respond to questions, supply feedback, and provide technical assistance and guidance. Similar interactions between states and localities are also expected. These interactions are important for ensuring effective implementation of the Act and efficient allocation and use of Perkins funds.

Interactions Between Federal and State Agencies

We assessed the extent of interactions between federal and state agencies by asking state directors what input and assistance they have received from the U.S. Department of Education concerning the implementation of the 1990 Perkins Act. Figure 3.3 summarizes the opinions of state vocational education directors concerning the U.S. Department of Education's assistance in implementing the 1990 Perkins Act. (For detailed statistics, see Appendix Tables A-3.6 and A-3.7.) In general, state directors of secondary and postsecondary vocational education have similar opinions, but the latter seem to be a little more satisfied with the Department's assistance. Since they have similar opinions, we will focus on the responses of secondary vocational education directors.

Figure 3.3
Agreement Rates of State Vocational Education Directors on U.S. Department of Education Assistance in Implementing the 1990 Perkins Act



Source: Omnibus Surveys of Secondary and Postsecondary State Agencies

One way to assess opinions is to see how many state directors agree or strongly agree about whether the Department has taken a certain kind of action (see Figure 3.3). If we define the "approval rate" as the sum of these percentages, we find that the approval rates given by the secondary vocational education directors are (in descending order): (1) provision of adequate opportunity for input in developing regulations for the 1990 Perkins Act, 73 percent; (2) responsiveness to inquiries related to state plans, 58 percent; (3) responsiveness to inquiries about regulations for the Perkins Act, 55 percent; (4) provision of Perkins Act information necessary for developing state plans, 50 percent; (5) timeless in handling state plans after they are submitted, 36 percent; and (6) provision of relevant and timely technical assistance on implementing new initiatives in the Act, 24 percent.

In the opinion of state directors, then, the Department of Education seems to listen well to what the state and local officials say. The Department is also responsive to inquiries related to state plans and regulations. But it seems to have had problems in evaluating and processing state plans in a timely manner and in providing technical assistance to implement provisions of the Perkins Act.

Interactions Between States and Localities

One of the aims of the Perkins Act is to stimulate reform at the local level, in part by shifting some resources from state administration to localities. At the same time, the Act increased the states' responsibilities in certain areas, such as developing performance standards and measures. We have seen that secondary state agencies lost Perkins funds and staff, their workloads increased, and their priorities shifted. Now we turn to local districts' perceptions of state leadership and state support for Perkins reforms. How much is provided, and how has this leadership and support changed between 1990–91 and 1991–92?

The Omnibus Survey asked vocational administrators in regular and vocational school districts about the level of leadership their states provided (see top of Table 3.3). Thirty-three percent of the regular school administrators said there was little or no leadership. About half indicated that the leadership was adequate and 14 percent said the state provided very good leadership. Vocational district administrators rated state leadership slightly higher, but the differences were not significant. In general, state leadership is not very strong in local districts. However, as Chapter 10 on education reform shows, when states do take an active leadership role, local districts are more likely to undertake vocational education reforms.

Asked whether state leadership improved between 1990–91 and 1991–92, about one-third of the **vocational** district officials believed state leadership declined during this period (see bottom of Table 3.3). Another one-third thought their states provided more leadership under the new law. The remaining one-third

Table 3.3
State Leadership and Assistance in Vocational Education, 1990–91 to 1991–92 (Percent of School Districts)

	Regular School District			Vocational School District		
	Very Good Support	Adequate Support	Little or No Support	Very Good Support	Adequate Support	Little or No Support
State leadership in general	14	53	33	17	53	30
	Increase	No Change	Decrease	Increase	No Change	Decrease
State leadership in general	30	52	27	33	32	35
State regulatory assistance	31	56	13	24	42	33
State assistance with curriculum development	43	47	10	34	35	31
State assistance with assessment and accountability	39	52	8	35	39	26

Source: Omnibus District Surveys, Versions A, B, and Vocational

believed there was no change. Regular district administrators were more likely to believe that state leadership did not change after the new law.

There was also a clear difference between regular and vocational district administrators in their feeling about changes in the amount of assistance provided by their states. Vocational district administrators were more likely than those in regular districts to believe that the amount of state assistance declined after the new law. For example, one-third of the vocational district administrators said their states' regulatory assistance declined from 1990 to 1992, but only 13 percent of the regular district administrators said the same thing (see Table 3.3). The fact that vocational district administrators were more likely to perceive a decline was also evident for other kinds of state assistance (i.e., in curriculum development and assessment and accountability.) It is our impression that vocational districts tend to be more closely linked to state vocational agencies than are regular districts. (Often, in fact, vocational districts are directly administered by the state agency.) Thus, vocational districts may be more affected by cutbacks in state offices.

As a rule, regular school district administrators tended to believe they received more state assistance under the new law. For example, 43 percent said that state assistance with curriculum development increased, and only 10 percent said it decreased. Among vocational district administrators, there was no consensus on this issue. About one-third said that state assistance with curriculum development increased and one-third said the opposite.

In the absence of increased assistance from their states, many school districts are experiencing more control and flexibility in program development and implementation: 40 percent of the vocational district officials and 33 percent of the regular district officials reported that such increases had taken place (see Table 3.4). With more control and flexibility, school districts should become more active in implementing the new law. This seems to have happened: Most district administrators reported marked increases in program improvement efforts, assessment efforts, interactions with business, and services for special populations at the local level. These changes were more pronounced in vocational districts than in regular districts. If decentralization is one intent of the 1990 Perkins Act, this evidence is encouraging.

However, simply allocating more money to the local level and increasing local control to stimulate implementation do not guarantee good outcomes. Evidence in Chapters 10 through 13 indicates that the implementation of some Perkins reforms is shallow and often ad hoc, and that states can play a vital role in advancing the reform process if they choose to do so.

State Support for Perkins Reforms

The Omnibus Surveys also contain information about the support states give local districts to implement specific Perkins reforms such as academic and vocational integration, tech prep, and education in all aspects of the industry. Figures 3.4 and 3.5 summarize the opinions of district administrators about the support they received from their states for these efforts.

The strongest support was for tech-prep programs. About 40 percent of vocational districts and 29 percent of regular districts said they had received very good state support for tech prep. In some cases, the award of tech-prep grants undoubtedly made it easy to identify state support. District administrators also received relatively good support for integrating vocational and academic programs: 74 percent of vocational districts and 66 percent of regular districts said support for this activity was at least adequate. It is not clear why regular school district officials are less satisfied with the support they receive. They may

Table 3.4
Changes in Vocational Programs, Practices, and Communications in School Districts, 1990–91 to 1991–92 (Percent of Districts)

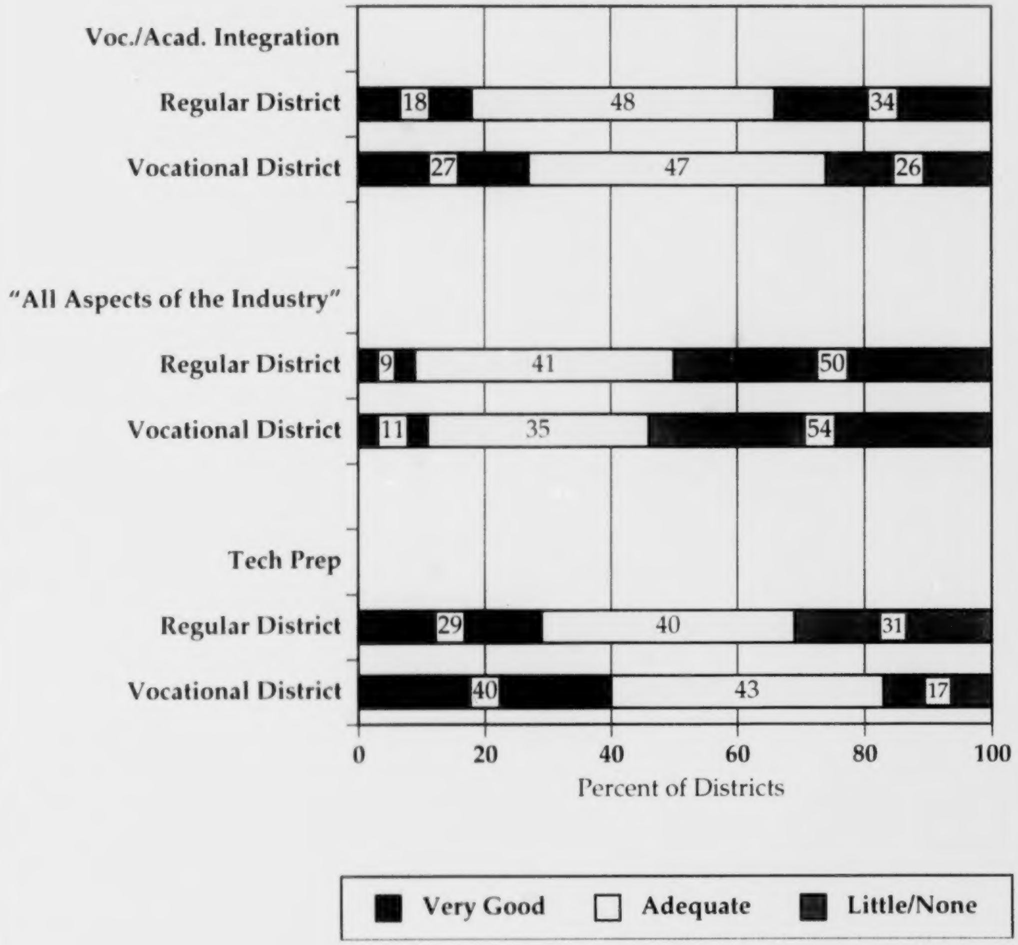
	Regular School District			Vocational School District		
Activity	Increase	No Change	Decrease	Increase	No Change	Decrease
Local control and flexibility in program development and implementation	33	57	10	40	53	8
Local program improvement efforts	71	27	3	86	13	1
Local assessment and accountability efforts	56	42	2	81	18	1
Interactions with business and industry	58	41	1	82	18	0
Services for special populations	58	41	2	84	16	1

Source: Omnibus District Surveys, Versions A, B, and Vocational

be less involved in the state vocational network than vocational districts, though we cannot be certain that this is the reason.

When officials were asked about the **changes** in state support for tech prep and integration, most indicated that support had increased. Once again, vocational districts were more likely to report state activism than regular districts. For example, 80 percent of those in vocational districts indicated increased state support for tech-prep programs, as compared to 58 percent for those in regular school districts. (See Figure 3.5.) The difference between the two kinds of districts in state support for tech prep and integration is worth noting because these programs, especially the latter, require substantial collaborative efforts between both kinds of districts.

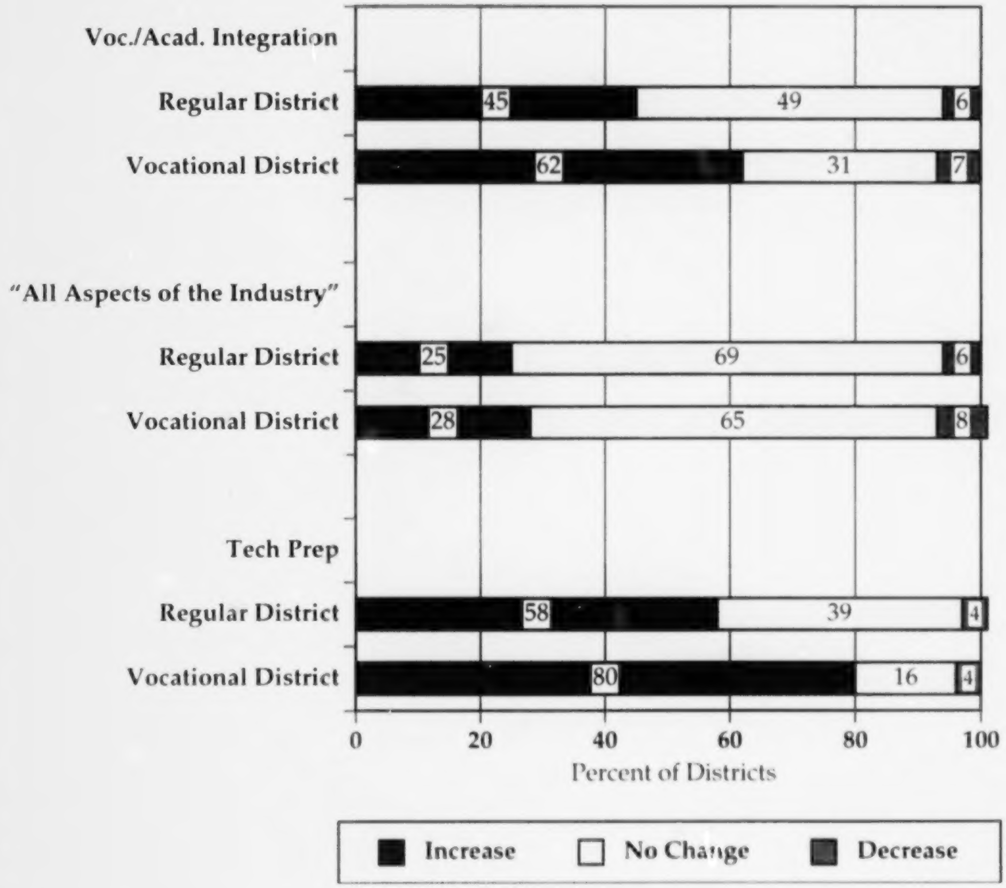
Figure 3.4
Level of State Support for Perkins Reforms



Source: Omnibus District Surveys, Versions A, B, and Vocational

Among all the new initiatives in the 1990 Perkins Act, education "in all aspects of the industry" seems to be the area in which school districts receive the least support from the states. As Figure 3.4 shows, a large proportion of district officials (54 percent in vocational districts and 50 percent in regular districts) said that they had received little or no state support for developing and implementing all aspects of the industry curricula. Furthermore, only a quarter of them indicated an **increase** in support for all aspects of the industry (see Figure 3.5). This issue is discussed more fully in Chapter 12.

Figure 3.5
Changes in State Support for Perkins Reforms, 1990–91 to 1991–92



Source: Omnibus District Surveys, Versions A, B, and Vocational

One important method to help implement the new Perkins initiatives at the classroom level is to provide in-service programs for teachers. Integration and tech prep were the subjects most likely to be covered in teacher training in 1991–92. About one-half of vocational districts and one-third of regular districts reported training in these areas (see Table 3.5). Serving special needs students and eliminating sex bias were covered in approximately one-third of vocational districts and one-fourth of regular districts. Among the training least likely to be provided, in a list of 14 subjects, was that for education in all aspects of the industry.

Table 3.5
Availability of In-Service Programs for Vocational Education Teachers, 1991–92 (Percent of Districts)[4]

Topics Covered in Programs	Type of District	
	Regular	Vocational
Integration of vocational and academic education	32	41
"All aspects of the industry" curriculum	12	10
Tech-prep programs	30	49
School-based work experience programs	12	13
Vocational instructional delivery methods		
Using new technologies	24	27
Teaching problem-solving	15	13
Cooperative learning	16	18
Active/hands-on learning	15	11
Interdisciplinary instruction	12	10
Basic skills instruction	14	18
Generic work skills instruction	7	9
Student assessment/performance evaluation	17	20
Serving vocational special needs students	23	29
Elimination of sex bias in vocational education	24	36

Source: Omnibus District Surveys, Versions A, B, and Vocational

In general, while in-service programs related to the Perkins initiatives (tech prep, integration, sex equity, and serving special population students) are not widespread, states do seem to focus their efforts on these topics, especially in vocational districts. The exception is in-service training on "all aspects of the industry" curriculum, which is provided in no more than 10–12 percent of districts. Since curriculum reform efforts such as tech prep, integration, and "all aspects" cannot be fully implemented at the classroom level without in-service training, even greater state efforts in these areas would be desirable.

CONCLUSION

Our analysis of the Omnibus Survey data reveals some interesting findings: First, state secondary and postsecondary agencies lost about 28 percent in Perkins funds between 1990–91 and 1991–92. The average size of secondary state offices was reduced from 36 to 28 FTE employees. Secondary offices that experienced substantial cuts in staff have heavy workloads and have started to reassign their staffs. While all offices have given a high priority to the development of performance standards and to special population issues, these overloaded, "high-reduction" offices have reduced the relative emphasis given to many other activities.

The reduced emphasis on other types of assistance in offices experiencing cutbacks could affect the implementation of some provisions in the 1990 Perkins Act, such as the integration of academic and vocational curricula. Analyses in Chapter 10 show that school districts can benefit from state assistance and support in implementing Perkins reforms.

Second, although more than half of the school districts in the Omnibus Surveys said that the leadership of their states in improving vocational education was at least adequate, only a small proportion indicated that state leadership was very good. There is no consensus among school district administrators on whether state leadership and technical assistance increased or decreased after the 1990 Perkins Act. But it is a matter of concern that more than one-third of the vocational districts indicated a decline in state assistance concerning regulations, curriculum development, and program evaluation and assessment. These findings are consistent with the changes in priorities reported by the states.

Third, despite merely adequate help from their states, school districts and local agencies were more active in developing integration and tech-prep programs after the new law than before. They also increased efforts related to program improvement, interactions with business, and providing services for special populations, largely without substantial assistance from the states. Vocational districts seem to be more active in implementing the new Act than regular districts.

The major concern about the implementation of the 1990 Act at the local level is that most of the activities are being undertaken without much leadership and assistance from the states. As later chapters indicate, Perkins reforms such as academic and vocational integration and tech prep are widespread, but their implementation is shallow and lacking coherence. States can play a valuable role in promoting deeper, more systemic reforms.

ENDNOTES

1 Section 403 (6) (1).

2 In the past, some states used Title II funds that were retained for statewide programs for state administration. These retained funds were eliminated in the 1990 Perkins Act. Instead, the new law allows states to use 8.5 percent or less of its Title II funds for state programs and leadership. States were not expected to use these new funds for administration. Even if they did, the amount of available funds was smaller.

3 The 15 percent benchmark is changed to 10 percent in analyzing postsecondary offices because they, on average, did not experience staff reductions as great as those in secondary offices. The change permits a larger number of observations for deriving estimates, and does not affect the generality of our analysis. Preliminary tabulations using the 15 percent benchmark for postsecondary offices show the same patterns as presented here.

4 Nonrespondents could not be separated from those respondents who had received no in-service training; both groups were included in the denominator when calculating the percentage of districts receiving in-service training. As a result, these percentages underestimate the true extent to which in-service training is offered. The underestimation is very slight for regular districts (no more than a one percentage point difference), but may be relatively large for vocational districts; for these districts, the true percentages could be up to 50% larger.

PART II

STUDENT PARTICIPATION IN VOCATIONAL EDUCATION

CHAPTER 4

PARTICIPATION IN SECONDARY VOCATIONAL EDUCATION

INTRODUCTION

The Perkins Act mandate for the National Assessment includes an evaluation of "participation in vocational education programs, including in particular, access of individuals who are members of special populations to high-quality vocational education programs."[1] This chapter examines participation and access at the secondary level. Postsecondary participation and access are addressed in the following chapter, and the availability of supplemental services, one requirement for equal access for special needs students, is discussed in Chapter 6.

This chapter reviews access to vocational education, current levels of participation in vocational education, and changes in participation over time. We look at the participation of students in general and of those students defined as special population students in the 1990 Perkins Act. Based on analyses of student transcripts, we determine which students take the most vocational education, and which are increasing or decreasing their vocational coursetaking over time. We find that vocational participation has declined for all student groups except for educationally disadvantaged students and disabled students, with a resulting concentration of these special populations in vocational programs.

Because the Perkins Act stresses a strong and broad-based academic foundation as part of a quality vocational program, we also assess vocational students' academic coursetaking. We find that vocational students take less academic coursework than their non-college-bound peers, although the coursetaking gap is narrowing. The chapter ends with an examination of administrators' opinions regarding the placement of students into vocational education, and the ability of vocational education to attract students. This section suggests that vocational education programs and students are becoming increasingly isolated and stigmatized.

Defining Access

A reading of the 1990 Perkins Act leaves no doubt as to the importance federal legislators place on ensuring that all students, particularly those with special needs, have equal access to quality vocational education programs. This fundamental goal runs throughout the legislation, but is especially emphasized in Section 118 of the Act, which mandates assurances of equal access from both states and localities.

Assessing students' access to vocational education, and to quality vocational education in particular, is not easy. One way is to examine coursetaking options that are available to students, and the courses that they actually take.[2] The 1989 National Assessment of Vocational Education found, for example, that disabled and academically disadvantaged students have good access to vocational education as measured by their relatively high levels of participation in vocational courses.[3] However, it found problems with access at the school level; students in "disadvantaged" schools were less likely than those in "advantaged" schools to have access to area vocational schools, which the assessment found to provide higher quality vocational education. Disadvantaged schools also offered their students fewer vocational programs and fewer advanced-level vocational courses.

This chapter explores student access to vocational education by examining access to area vocational schools (AVSs) and other specialized vocational schools. Participation in vocational education is also reviewed, both to shed further light on access issues and to reveal trends in vocational coursetaking.

One aspect of the access issue deserves further attention. Our discussions with school and district administrators raised the issue of a "reverse access" problem, that of special needs students enrolling in vocational education to such an extent that other students then avoid it. This process may contribute to the stigmatization of vocational education and work to the detriment of special population (as well as other vocational) students. Exploring this issue more fully requires examining the role of vocational education within the larger educational enterprise.

The Role of Vocational Education

Typically, high school students choose one of three educational programs or tracks. Some select the college-prep track to prepare for four-year postsecondary education, others select the vocational track to prepare for a skilled or semi-skilled job. Students who choose neither of these are commonly referred to as "general track" students, as their courses comprise a less focused, broader educational program that prepares them for functional citizenship, with no strong emphasis on either academic or vocational skills. In contrast, the college-prep track is highly structured, as it is based on the college entry requirements established by postsecondary education.

Relative to the college-prep curriculum, the vocational curriculum is typically less structured, less visible, and less valued.[4] This distinction corresponds to the social and economic value that society as a whole places on college-educated individuals relative to those who have not attended college. [5] As a result, while some school systems insist that their vocational students complete a rigorous, structured educational program, most do not. Vocational (as well as general track) students are typically left to make their own choices, particularly among academic courses. When schools do provide help, it is typically in the form of career exploration activities or guidance counselors; both can provide valuable information, but by no means ensure that students follow a coherent educational program.

In spite of its limited structure, the hands-on nature of vocational instruction and its link to subsequent employment are viewed as means of keeping in school students who might drop out if the traditional approach were all that was available. This view of vocational education as a dropout prevention program extends back at least to the 1917 Smith-Hughes Act. However, while reducing dropout rates is a laudable goal, the empirical evidence on vocational education's effectiveness in doing so is mixed, at best (see Chapter 15).

Even if vocational programs do reduce dropout rates, many argue that vocational education should not be a dropout prevention program. They believe that vocational education is solely a workforce preparation program, and that focusing on dropout prevention detracts from this basic goal; the rigor of vocational education programs declines if their primary aim is to retain in school students who cannot (or will not) accept greater challenge.

On the other hand, some advocates for special population students note that vocational education serves a valuable and legitimate purpose for special needs students whose achievement or motivation levels prohibit college attendance. Vocational programs have been found to improve the employment outcomes (wage and/or employment rates) of disabled students and of others who find work in jobs related to their training, making these programs valuable routes to self-sufficiency and upward mobility, at least for some (see Chapter 15).

This latter argument implies that special needs students should be enrolled in vocational education in relatively high numbers — since vocational education is the most marketable alternative to the college-prep curriculum, it is the natural place for all students who are not college-bound. The irony is that this noble goal can have undesirable consequences. Well-intentioned administrators and teachers who believe in the need to serve special populations have noted that vocational programs with relatively high enrollments of special needs students often develop a self-defeating stigma. Average or middle-ability students avoid enrolling in these programs because they do not want to be associated with "those" students, or because they find classes with low-ability or unmotivated students too slow and uninteresting. In this perspective, programs lose the opportunity to serve many students for whom vocational education is potentially of interest and use, particularly since "average" students constitute a large part of the future technical workforce.

The concern voiced by these educators is that as more special needs students enroll in vocational education, and fewer non-special needs students enroll, program quality becomes harder to maintain. The level of instruction is lowered, employers become less supportive, and the entire vocational program becomes more marginal to the school system's educational efforts. In short, serious efforts to educate these students may be replaced by efforts to "get them through" with as little effort or trouble as possible on anyone's part.

There is also concern that the channeling of resources specifically for special population students may exacerbate this problem. Evidence suggests that schools sometimes place special needs students in vocational programs not just because they are "academic dropouts," but also because that is where the money exists to provide the services they need (see Chapters 6 and 7). If assistance is not available elsewhere, supplemental services designed to encourage student access to vocational programs can also limit their access to other educational alternatives, while simultaneously encouraging the marginalization of the program to which they have most access.

Ultimately, the basic issue is the degree to which vocational education programs, or any programs, serve students' interests and needs. This issue raises a series of questions: Is it appropriate to place students in vocational education simply because they are not "college material" or because they are behavior problems? If not, what is the appropriate alternative for these students? Should access to some or all of vocational education be restricted by factors such as student motivation and achievement — factors that are currently accepted as limitations on college-prep enrollments but typically not on vocational enrollments? If restrictions are acceptable, what viable options are left for students who are neither college-prep nor vocational? And if restrictions are not acceptable, how can vocational education avoid becoming increasingly marginalized?

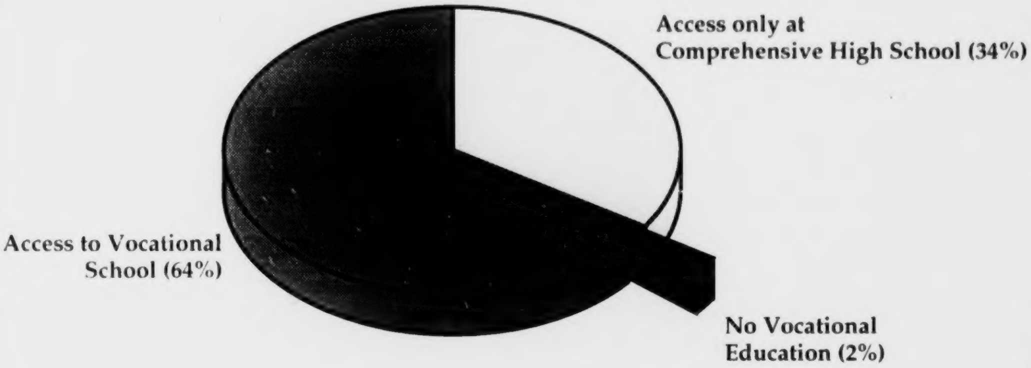
We cannot fully resolve these issues here. We raise them because they are the fundamental issues that determine how one interprets information on student access to and participation in vocational education. For example, should disabled students participate in vocational education at equal rates or at higher rates than other students? Is it good or bad if these students are increasingly enrolling in vocational education while other students take less vocational education? How one answers these questions depends on the role one believes vocational education should play within the larger education system — or, perhaps more accurately, on the priorities one places on the various goals that vocational education is called upon to serve.

ACCESS TO VOCATIONAL EDUCATION

Vocational education can be provided to students through programs offered at comprehensive high schools or at specialized vocational schools, including area vocational schools and vocational high schools. One basic question concerns the extent to which students in general, and special population students in particular, have access to each of these delivery systems.

As Figure 4.1 shows, vocational education is almost universally available. Only 2 percent of regular school districts do not offer any vocational courses in comprehensive high schools or through access to vocational schools. Some 79 percent of regular districts offer vocational education in comprehensive high schools; only 16 percent administer their own vocational schools. But since the majority of districts have access to AVSs run by vocational districts, vocational schools are actually more accessible than these figures indicate: 64 percent of districts (with 63% of enrollments) offer access to vocational schools either within their district or through another district's AVS. Thus, only 36 percent of regular districts (serving 37% of students) do not provide access to separate vocational schools.

Figure 4.1
Regular School Districts Providing Access to Vocational Education at Each Type of School, 1991–92



Source: Omnibus District Surveys, Versions A and B

Vocational schools are often considered superior to comprehensive high schools because their specialized facilities offer a wider array and greater depth of vocational training. We will see in later chapters that vocational schools are also more likely than comprehensive high schools to integrate academic and vocational education, to offer tech-prep programs, and to be linked to employers. Past research has also shown that AVSs in particular tend to offer more extensive vocational preparation.[6] So it is interesting to note that the availability of vocational schools varies among different types of school districts and schools.

Suburban districts are the most likely to provide access to AVSs and to vocational schools in general, and rural districts are the least likely. For example, 80 percent of suburban districts provide access to vocational schools, compared to 68 percent of urban districts and 55 percent of rural districts. (See Appendix Table A-4.1.)

School-level data show a similar pattern, although with lower levels of access overall: 61 percent of suburban comprehensive high schools have access to an area vocational school, compared to 40 percent of rural high schools and 38 percent of urban high schools (see Table 4.1). This difference is particularly striking because earlier federal legislation targeted money for the construction of area vocational schools to increase rural students' access to vocational education.[7] In contrast, vocational high schools are more likely to be located in rural and urban areas than in suburban areas. However, because the concentration of AVSs in suburban areas outweighs the concentration of vocational high schools in rural and urban areas, suburban areas provide more access to specialized vocational schools.

Table 4.1
Percent of Schools in Rural, Suburban, and Urban Areas that Have Access to AVS or Are Vocational High Schools

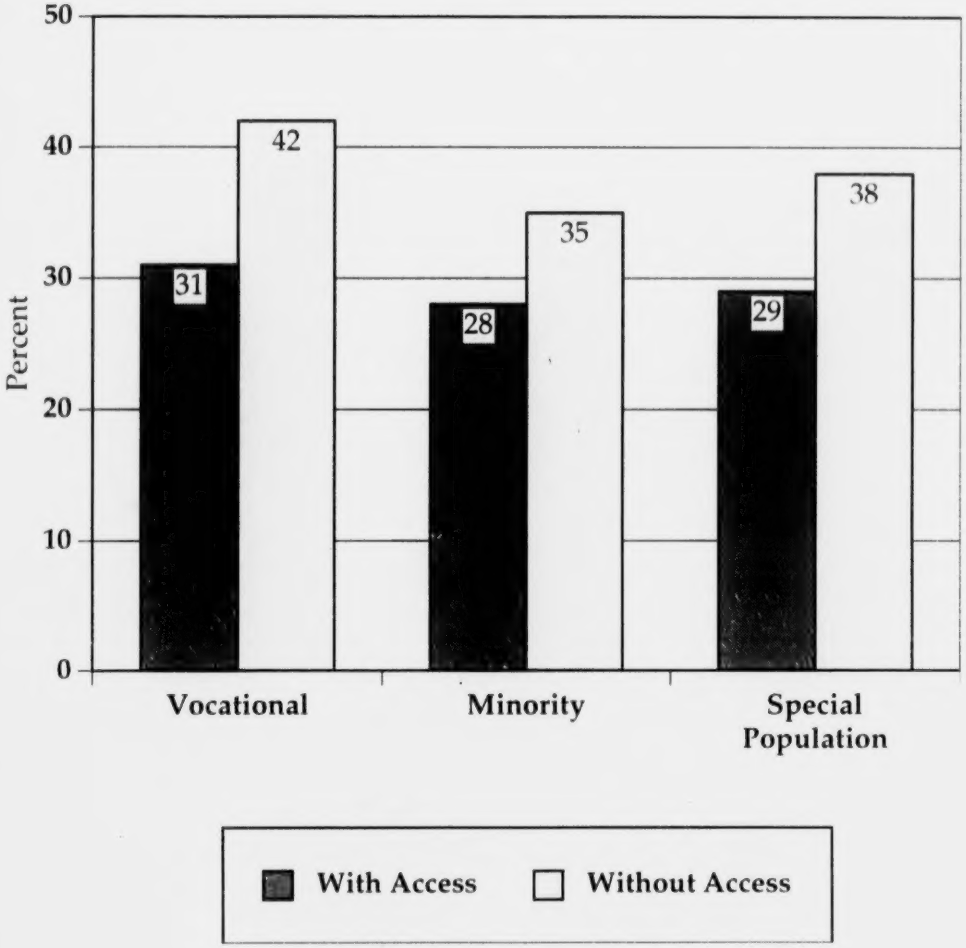
Percent of Schools in Given Area that are:	Rural	Suburban	Urban
Comprehensive high school with access to area vocational school	40	61	38
Vocational high school	10	4	13
Either of the above	50	65	51

Source: Omnibus Survey of Secondary Schools

At least partly because of their greater concentration in suburban areas, AVSs are less accessible to special population students, minority students, and — ironically — vocational students (see Figure 4.2, and Appendix Table A-4.1). For example, while 75 percent of districts with the lowest concentration of special population students[8] provide access to vocational schools, only 52 percent of the districts with the highest concentration of special population students provide access to these schools.

School-level data verify this pattern: 52 percent of schools with the lowest concentration of special population students have dual enrollments with AVSs, compared to 40 percent of schools with the highest concentration of special population students. As a result, 29 percent of the students in comprehensive

Figure 4.2
Average Percent of Students in Comprehensive High Schools With and Without Access to Area Vocational Schools, 1991–92



Source: Omnibus Survey of Secondary Schools

high schools with access to AVSs are disabled, limited English proficient (LEP), or economically disadvantaged; but 38 percent of the students in schools that do not have access to an AVS fall into these special population categories.[9]

Schools with access to AVSs also enroll smaller proportions of minority students than schools without access, as well as fewer students in vocational programs. Schools with AVS access serve students that are 28 percent minority, but those without access serve students that are 35 percent minority. Finally, only 31 percent of the students in schools that have access to AVSs are vocational students, compared to 42 percent in schools that do not have access to AVSs (based on school administrators' reports on the Omnibus Surveys).

In short, schools that enroll more special needs students, more minority students, and more vocational students tend to have less access to the specialized facilities and resources of an AVS. Do these findings mean that special population and minority students, who are more concentrated in urban areas, are under-represented in vocational schools? Not necessarily.

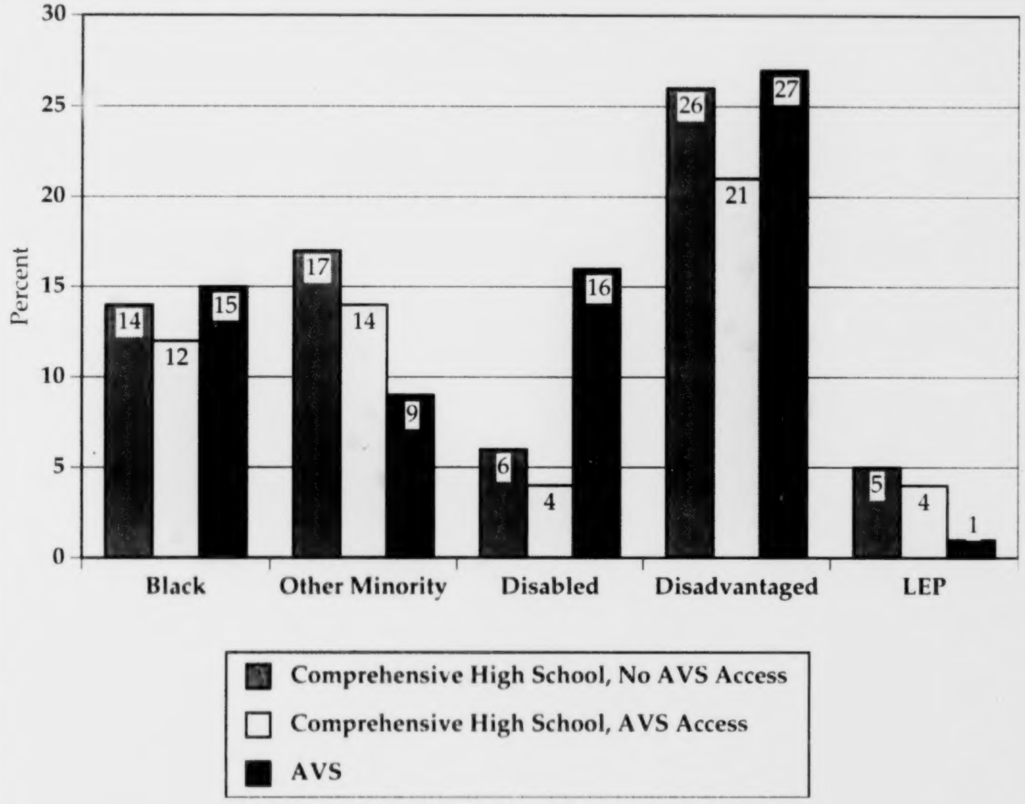
First, as we saw above, urban and rural areas are more likely than suburban areas to have vocational high schools, which students attend instead of comprehensive high schools. In larger cities especially, many of these are occupational magnet schools that provide a wide array of vocational offerings. Access to good-quality vocational high schools offsets, to some extent, the suburbs' advantage in access to area vocational schools.

Second, special population students are over-represented in area vocational schools. Figure 4.3 shows the enrollments of minority and special population students in comprehensive high schools with and without access to AVSs. It also shows their enrollments in area vocational schools. Disabled and disadvantaged students (and possibly black students) enroll in AVSs at rates higher than one would expect given their access to these schools. On the other hand, non-black minority students (primarily Hispanics and Asians) and LEP students are less likely to enroll in AVSs than one would expect from their access to them.[10]

The over-enrollment of disabled students in AVSs is particularly large and striking. While only 4 percent of students at schools with access to an AVS are disabled, 16 percent of AVS students are disabled. This is probaby due to AVSs' tendency to provide vocational programs designed specifically for disabled students. As noted in our community case study sites: "Many. . . area vocational schools or vocational magnets within districts are also the area or magnet school for separate classes in vocational education for the disabled, and thus draw these students for the special services they can provide."[11] This focus on serving disabled students is encouraging in terms of access to quality vocational education, but may at the same time contribute to the stigmatization of these schools. (We return to this issue at the end of the chapter.)

The apparent over- and under-enrollment of other students in AVSs is more difficult to explain. Disadvantaged students may be counseled into vocational education because their postsecondary prospects are considered poor, or because they themselves are considered problem students. In the case of LEP students, the decision to not attend AVSs may be partly due to a lack of language services in vocational programs[12]; this could also apply to Asians, Hispanics, and other ethnic minorities (although Asians as a group are also less vocationally oriented). The community case study researchers also reported that "Hispanic students do

Figure 4.3
Average Percent of Minority and Special Needs Students in Each Type of School



Source: Omnibus Survey of Secondary Schools

not wish to be in black-majority or white-majority schools, resulting in self limitations on opportunities to attend magnet schools or magnet academies;"[13] this might also reduce their enrollments in AVSs.

ENROLLMENTS IN VOCATIONAL EDUCATION

Trends in vocational education enrollments reflect a variety of influences on the vocational education system, including demographic changes, the effects of labor markets, and the perceived value of vocational versus other types of education, as well as federal, state, and local policies related to education. Monitoring these enrollment trends allows us to evaluate the health of the vocational education system and to determine when policy action may be necessary to achieve federal goals in vocational education.

Our analysis of student enrollments includes two perspectives — administrators' reports on student enrollments, and counts of credits earned by students derived from analyses of student transcripts. The latter provide the most detailed information on vocational enrollment patterns, but the former provide information on the relation between enrollments and other district characteristics that are not available in the student transcripts. We look first at administrators' reports.

Administrator Reports on Enrollments

Declining vocational enrollments have been a concern for a number of years. On our Omnibus Surveys, regular school districts report that, on average, total and vocational student enrollments have remained constant from 1987 to 1991 (see Table 4.2). This is a more optimistic picture than that presented by student-level data, which show a 6 percent decline in grade 9–12 public school enrollments from 1987 to 1990[14] and a 16 percent decline in vocational enrollments (based on the number of vocational credits earned). The community case study sites also revealed widespread declines in vocational enrollments.[15]

Vocational districts do report a drop in vocational enrollments (see Table 4.2). This suggests that whatever factors are causing vocational enrollment declines are having a larger effect on AVSs than on other high schools — or that additional factors are operating in these districts. For example, in the community case study sites, researchers found that increasingly tight budgets have made transportation to AVSs more problematic and have led some school districts to keep vocational students in their home schools, so that the district will receive extra state funds (in states that provide extra funding for vocational students).[16] Scheduling conflicts also make it more difficult for students to attend AVSs, and this problem has become more severe as academic requirements have increased, leaving less room for elective courses.

Meanwhile, the percentage of special population students enrolled in vocational education has increased. Table 4.2 shows that more districts, both regular and vocational, report increases of special population enrollments than report decreases. Enrollments of disabled, disadvantaged, and to a lesser extent LEP students have increased on average in vocational districts, while total vocational enrollments have declined. This suggests that special population students are an increasing percentage of vocational students in these districts. In regular districts, the enrollment of disadvantaged students in vocational education has increased significantly more than total vocational enrollments, suggesting that disadvantaged students also make up an increasing share of vocational enrollments in these districts. As we will see later, student transcript data also

Table 4.2
Percent of Districts with Given Enrollment Changes, 1987–88 to 1991–92, and Mean Change, By District Type

	Percent of Districts Where Enrollment: [a]		
	Decreased	Increased	Mean Change[b]
Regular Districts			
Total student enrollment	30	30	3.0
Total vocational education enrollment	31	23	2.9
Vocational enrollments of:			
Disabled students	6	21	3.2
Disadvantaged students	7	33	3.3
LEP students	2	14	3.1
Other special needs students	4	18	3.2
Vocational Districts			
Total student enrollment	49	24	2.6
Disabled students	8	37	3.4
Disadvantaged students	6	58	3.7
LEP students	3	14	3.1
Other special needs students	4	35	3.4

[a] A third category, "No or minimal change," has been omitted. Including this category would account for 100% of districts in each row.

[b] Based on ratings on a 5-point scale: 1 = Large decrease (>10%), 2 = Moderate decrease (6–10%), 3 = No or minimal change (±5%), 4 = Moderate increase (6–10%), and 5 = Large increase (>10%). A mean of 3.0 signifies no change, on average. All differences between regular and vocational district enrollment means are significant at $p<.05$, except for LEP student means, which are not significantly different.

Source: Omnibus Surveys of Regular Districts (Versions A and B), and of Vocational Districts

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suggest that the percentage of disabled and educationally disadvantaged students enrolled in vocational education has grown.

While special population students are increasing in vocational programs generally, the increase has been particularly large in vocational districts. This trend was clear enough to be noted by the community case study researchers, who reported that "On the whole, [vocational schools] tend to enroll slightly higher percentages of minorities, of special populations students, and of boys. Moreover, this tendency has been increasing."[17] This increase may result in part from vocational districts' efforts to counteract their overall enrollment declines by increasing the recruitment of disabled and disadvantaged students. (We will see some evidence of this in Chapter 6.)

From 1987–88 to 1991–92, then, level or declining vocational enrollments were offset somewhat by increasing enrollments of disabled and disadvantaged students. These increases were particularly large in vocational districts and in districts that might be characterized as disadvantaged — urban districts, districts with high concentrations of special population students, and districts that received Perkins funding during this period (see Appendix Table A-4.2). Transcript data reinforce the overall pattern of declining vocational enrollments, with increasing enrollments among some special population students.

Transcript Data on Enrollments and Coursetaking

Administrators' reports on enrollment changes are informative but limited. Student transcript data provide a richer and more objective measure of changes in vocational enrollments over time. This section uses transcript data to examine four coursetaking issues related to the Perkins mandate to examine student participation:

- What are the overall coursetaking trends in academic and vocational education?

- To what extent do students take "coherent sequences" of vocational courses?

- Which students take the most vocational education, and which have increased or decreased their vocational coursetaking over time?

- What proportion of students are in the vocational track? And how much academic preparation do these vocational students receive?

The Transcript Data. The previous National Assessment used student transcript data from various years between 1969 and 1987 to examine coursetaking behavior over time. In this assessment, we extend that analysis, using transcripts from the 1990 National Assessment of Educational Progress (NAEP). In addition, we expand previous analyses of the 1987 NAEP transcripts and 1982 High School and Beyond (HSB) transcripts to examine additional coursetaking issues, such as who is "leaving" vocational education and the extent to which students take a coherent sequence of vocational courses.[18]

The NAEP data permit us to examine some types of special population students, although the data are limited in this respect. Of the four major special population student groups listed in the Perkins Act — disabled, educationally disadvantaged, economically disadvantaged, and limited English proficient — the NAEP allows us to identify only disabled and educationally disadvantaged students. The latter are not explicitly identified, but we created a measure of educational disadvantage based on students' grade-point average.[19] Also, although the NAEP does include a small LEP student sample, it includes only those students who were identified as LEP in the 12th grade; this sample is not valid for our purposes and so is not examined.[20]

Coursetaking on the transcript data is counted in Carnegie units, each of which is equivalent to a one-hour course that meets daily for a full school year. For the sake of simplicity, we will refer to a Carnegie unit as a course or credit.

OVERALL TRENDS IN COURSETAKING

The previous Assessment found that from 1969 to 1987, students' *total* course load increased. As the Assessment noted, this overall trend masked two periods of coursetaking changes. During the 1970s, the growth in the total number of credits came from increases in vocational and (to a lesser extent) "personal use "courses, but in the 1980s it resulted from increases in academic coursetaking. In both periods growth in one part of the curriculum came at some expense to the other part. Thus, the long-term pattern has been one of increasing coursework overall, combined with shifts out of academic and into vocational courses (1970s pattern), followed by shifts out of vocational and into academic courses (1980s pattern).

The 1980s pattern continued with the class of 1990 (see Table 4.3). Students' total credits continued to increase, while vocational coursetaking decreased, from its peak of 4.9 credits in 1979–1982 to 4.1 in 1990. In that recent year, vocational coursetaking was a smaller proportion of total coursetaking than it has been in any of the years for which data are available.

To understand the full impact of enrollment shifts in different curriculum areas, these shifts must be examined in conjunction with changes in the size of the high-school-aged cohort. For example, the 1970s (until 1977) were a period of increasing high school enrollments. Thus the growth of vocational enrollments at that time, combined with a larger student body, created high demand for

Table 4.3
Average Number and Percent of Credits Completed by High School Students in Three Curriculum Areas, 1969 to 1990

	High School Graduating Classes of:					
	1969	1975–1978	1979–1982	1982	1987	1990
Number of Credits	20.5	20.8	21.2	21.4	22.8	23.5
Academic	14.9	14.0	13.9	14.2	15.6	16.7
Vocational	3.7	4.5	4.9	4.6	4.4	4.1
Personal use	1.9	2.3	2.4	2.6	2.7	2.7
Percent of Credits						
Academic	73	67	66	66	69	71
Vocational	18	22	23	22	19	17
Personal use	9	11	11	12	11	11

Source: Muraskin (1993), and 1990 NAEP

vocational teachers and courses, while declines in academic coursetaking were attenuated by the growth in overall enrollments.

In contrast, the drop in vocational credits earned from 1982 to 1990 has been exacerbated by a shrinking student body. The number of vocational credits students earned has dropped by about 11 percent, but with the decrease in the size of the high school student body there has been an overall decline of 23 percent in vocational credits. Over the same years, there was only a 6 percent decline in total credits earned, and a 1 percent increase in academic credits. Thus, while demand for vocational courses has declined substantially, demand for academic courses has remained fairly constant, in spite of declines in the student cohort.

The 1989 Assessment noted that the current shift toward academic courses seems to be a result of 1980s reform efforts to improve student academic attainment, particularly by increasing high school graduation requirements in academic subject areas. Academic requirements did increase substantially from 1982 to 1986 (the period covered by the first Assessment), and are still increasing, although the rate of increase has slowed (see Appendix Table A-4.3). Hence, students' academic coursetaking has also increased. We now examine this growth in academic coursetaking in more detail.

Trends in Academic Coursetaking

The 1980s saw increased coursetaking in all academic subjects — the core areas of mathematics, science, English and social studies, as well as foreign languages. These continued in 1990 (see Figure 4.4). With the exception of English, which appears to have topped out at 4.0 (an average of one English course per year), credits earned in all academic areas increased from 1987 to 1990, and have recouped the losses that accrued during the 1970s.

Let us examine two academic course areas that are of particular importance to technical training — mathematics and science.

Mathematics. The previous Assessment documented shifts in mathematics coursetaking — from basic to applied mathematics, and from algebra to pre-algebra — as well as increases in geometry, calculus, and other advanced mathematics courses from 1969 to 1987. Our analysis shows that from 1982 to 1990, most of the increase in mathematics coursetaking has been for courses at the level of algebra or higher. For example, while a constant 61 percent of students earned credits in mathematics courses below the algebra level, the percentage of students earning credits at the level of algebra or higher increased from 71 percent in 1982 to 82 percent in 1990 (see Table 4.4).

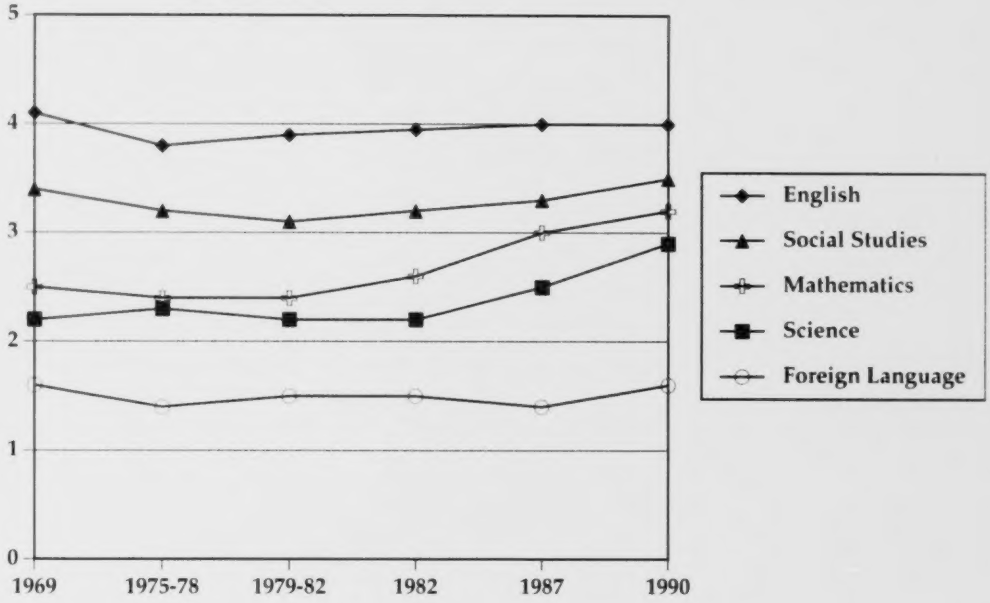
Science. With the exception of physics (for which the data are erratic), coursetaking in all sciences declined during the 1970s, then increased in the 1980s.[21] From 1982 to 1990, the number of credits students completed in science survey,[22] biology, and chemistry increased, while physics credits remained constant (see Table 4.5). Similarly, participation rates (the percentage of students earning science credits) increased for all types of science courses, with 1990 rates surpassing those for 1969, prior to the decline of the 1970s.

Some analysts have argued that increases in academic coursetaking are mainly illusionary, reflecting increases in introductory or remedial courses, rather than increases in intermediate or advanced coursetaking. These transcript data contradict that argument: The gains have been made in higher level mathematics and across all types of science courses except physics. (This conclusion assumes that course titles reflect similar course content over time, so that, for example, a 1990 algebra course is at the same instructional level as a 1969 algebra course.)

Trends in Vocational Coursetaking

We have seen that vocational coursetaking increased during the 1970s, and has been decreasing since the 1980s. Here we examine changes in the number of

Figure 4.4
Average Number of Credits Earned in Academic Subjects, 1969–90



Source: Muraskin (1993), and 1990 NAEP

Table 4.4
Average Credits Completed and Percent of Students Earning Credits in Mathematics, By Level of Mathematics, 1982, 1987, and 1990

	1982	1987	1990
Average number of credits earned in:			
All mathematics	2.6	3.0	3.2
All math less than algebra	0.9	1.0	1.0
All math algebra or higher	1.6	2.0	2.2
Percent earning credits in:			
All mathematics	99	100	100
All math less than algebra	61	61	61
All math algebra or higher	71	78	82

Source: 1982 HSB, 1987 NAEP, and 1990 NAEP

Table 4.5
Average Credits Completed and Percent of Students Earning Credits in Science, By Type of Science Course, 1969–1990

	1969	1982	1987	1990
Average number of credits in:				
All science	—	2.2	2.5	2.8
Science survey	—	0.7	0.8	0.8
Biology	—	0.9	1.1	1.1
Chemistry	—	0.3	0.5	0.5
Physics	—	0.2	0.2	0.2
Percent earning credits in:				
All science	—	98	99	>99
Science survey	72	70	72	77
Biology	86	79	89	93
Chemistry	37	32	43	50
Physics	13	17	20	23

— Data not available

Source: Muraskin (1993), 1982 HSB, 1987 NAEP, and 1990 NAEP

vocational credits students earn, as well the areas in which they earn credits. For the latter, we use the Secondary School Taxonomy categories of general labor market preparation (which includes typing, industrial arts or technology education, career education, and academic courses designed for vocational students); specific labor market preparation (which includes all courses directly related to preparation for an occupational field, such as drafting and business word processing); and consumer and homemaking education (including all non-occupational courses in this area). We also examine trends within specific labor market areas (e.g., agriculture, business, health).

Number of Vocational Credits Earned. In 1990, the average student earned 4.1 credits in vocational education. While only 3 percent of students earned no vocational credits, over one-quarter (27%) earned at least six such credits (see Table 4.6).

Table 4.6
Percentage of Students Taking Specified Number of Credits in Vocational Education, in 1982, 1987, and 1990

	1982	1987	1990
0 credits	2	2	3
0.01–1.99 credits	15	16	20
2.00–3.99 credits	25	27	29
4.00–5.99 credits	25	24	21
6.00–7.99 credits	18	17	15
8.00 or more credits	15	13	12

Source: 1982 HSB, 1987 NAEP, and 1990 NAEP

Table 4.6 shows that the reduction in vocational coursetaking from 1982 to 1990 results mainly from more students taking only a few vocational courses and fewer students taking large numbers of courses. One explanation offered for students taking fewer vocational courses is that increasing graduation requirements have reduced their coursetaking options. While this may have some effect on vocational enrollments, other factors also appear to be important. For example, if the decline in vocational credits were due entirely to increased graduation requirements, one might expect the enrollment decline to be largest for students at the highest levels of vocational coursetaking, since it would be most difficult for these students to fit additional required courses into their schedule. However, the shift from higher to lower numbers of vocational credits is about the same — 3 to 4 percentage points — for students who earn 8 or more credits as for those who earn 6–8 credits and those who earn 4–6 credits. We will return to the issue of what is causing vocational enrollment declines in the next section.

Credits Earned in Vocational Sub-curriculum Areas. Most of the vocational credits that students earn are in specific labor market preparation courses (agriculture, business, etc.). In 1990, 87 percent of students took courses in this part of the vocational curriculum, accounting for 66 percent of earned vocational credits. General labor market preparation courses (typing, industrial arts, career education, etc.) are the next most popular, enrolling 72 percent of all students and accounting for 20 percent of vocational credits. Consumer and homemaking courses are less prevalent, enrolling 48 percent of students and accounting for 14 percent of vocational credits.

Coursetaking in all three areas increased in the 1970s and decreased in the 1980s, but not to the same extent (see Figure 4.5). Specific labor market preparation courses increased the most and decreased the least, while general labor preparation courses increased the least and decreased the most. As a result, specific labor market credits increased from 57 percent of all vocational credits earned in 1969 to 66 percent in 1990, while general labor market credits declined from 30 percent to 20 percent. (Consumer and homemaking credits remained a relatively stable 13 to 15% of all vocational credits.)

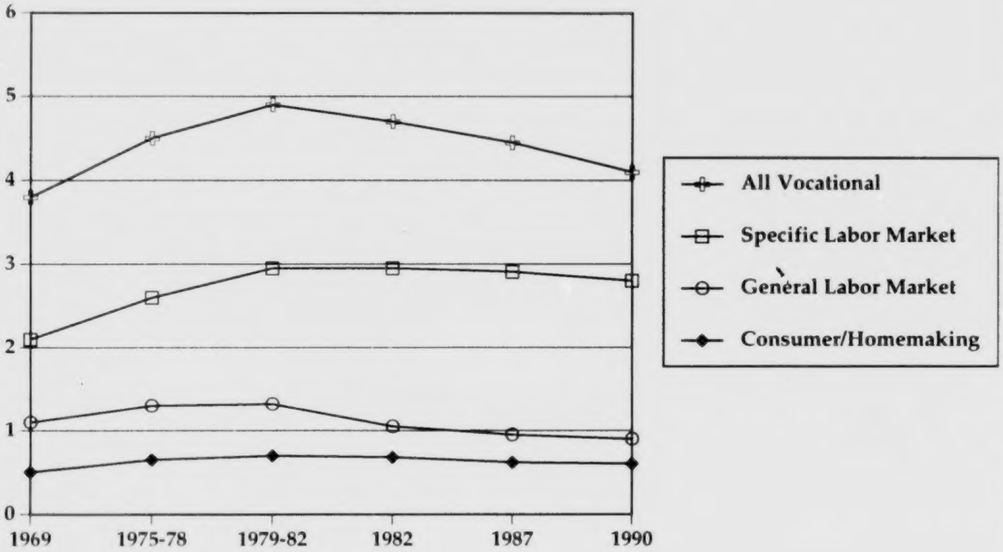
The ratio of specific labor market courses to general labor market courses provides another view of this trade-off: In 1969, students took 1.9 times as many credits in specific labor market courses as in general labor market courses; by 1990, they were taking 3.4 times as many. Why vocational education has been moving in this direction is unclear. Labor market demands for increasingly technical skills could be a factor, as could student interest in courses that relate to specific occupations. The growth of AVSs and magnet vocational schools also may have helped move vocational education in this direction, as these schools specialize in specific labor market preparation.

Credits Earned in Specific Labor Market Courses. Secondary courses within the specific labor market preparation curriculum can be divided into seven program areas: agriculture, business, marketing (formerly distributive education), health, occupational home economics, trade and industry (T&I), and technical/communications. Of these, business and T&I courses are the two most popular, with each accounting for over one-third of all credits earned in the specific labor market curriculum, and enrolling over one-half and one-third (respectively) of all students (see Table 4.7). The five remaining program areas have much smaller, roughly equivalent enrollments.

From 1982 to 1990, enrollment levels remained remarkably stable in most specific vocational program areas. However, the two most popular programs, business and T&I, showed a notable decline, and technical/communications showed a notable increase. The specific nature of these changes is revealing. Although more students are earning business credits, fewer students are earning three or more credits. This may reflect the expansion of computer word-processing courses, which appeal to many college-bound students as well as to students preparing for careers in business support. Similarly, although increasing numbers of students are earning technical and communications credits, the number concentrating in this area (earning at least three credits) is not increasing; again, this could reflect college-bound students' interest in taking computer-related courses. Finally, fewer students are earning any T&I credits and fewer are concentrating in this area. The trades appear to be unequivocally on the decline.

Although these transcript data show steady or slightly declining enrollments in health courses, preliminary analyses of transcripts from the 1992 National Education Longitudinal Study suggest that these enrollments increased from

Figure 4.5
Average Number of Credits Earned in the Vocational Curricular Areas, 1969–90



Source: Muraskin (1993), and 1990 NAEP

1990 to 1992, which confirms district administrator and case study reports of increasing enrollments in this area. Thus, health appears to be another program area experiencing (recent) enrollment increases.

In short, declining enrollments in the two largest vocational program areas, business and T&I, seem to be driving the decline in specific labor market enrollments. Increases in technical and communications courses appear to be rather substantial, but because this program enrolls so few students, the increase has little effect on overall trends. These enrollment trends may be related to changes in the labor market, although we cannot be sure. For example, from 1983–1991, positions in administrative support (part of business education) and precision production (part of trade and industry) have had slower-than-average growth rates, while technical positions (especially in health) have had higher than average growth rates.[23]

Economics and Vocational Enrollments

The community case studies provide evidence that local labor markets are indeed important factors in the success of vocational programs. In sites where well-paying technical jobs were available, vocational programs were typically

Table 4.7
Percent of Students Earning Credits and Average Number of Credits Earned, By Labor Market Preparation Area, 1982, 1987, and 1990

	Agriculture	Business	Marketing	Health	Occup. Home Ec.	T&I	Tech/ Comm
Percent of students earning any credits							
1982	10	53	9	5	11	40	13
1987	8	54	9	5	11	38	25
1990	9	55	9	3	10	36	26
Percent of students earning at least 3 credits							
1982	3	12	1	2	2	15	<1
1987	3	11	1	2	2	13	1
1990	3	9	1	2	2	12	<1
Average number of credits earned							
1982	.21	1.03	.16	.05	.17	1.06	.11
1987	.19	.97	.16	.07	.19	.96	.24
1990	.20	.90	.16	.04	.17	.87	.22

Source: 1990 NAEP

seen as the path to those jobs and were doing well. In sites where the labor market did not provide jobs, or provided only low-paying, lower skill service jobs, vocational programs appeared to be in trouble. Some examples follow.

In an eastern state that has lost its manufacturing base:

> Vocational education in this community seemed to be characterized by a check-and-balance system, related to program demand and employer input . . . Students in this community had seen their fathers' jobs swept out from under their feet, so they and their parents tended to take their vocational education very seriously.

> Programs that didn't have positive effects for students in the job market were not in great demand.

In one northeastern city with a troubled vocational program it was reported that

> the school used to have a job fair each year, but last year they changed the name of the activity because there were no jobs available. As placement officials retired, they were not replaced. Sometimes teachers are able to place a few students in jobs . . . but it is the exception rather than the rule.

In a midwestern state:

> A depressed economy and lower enrollments at the area vocational schools . . . have prompted the once-selective school to recruit heavily for almost "any and all" students.

The health of state and local economies also affects education budgets, which in turn affect educational offerings. Vocational programs seem to be especially vulnerable to budget cutbacks. In districts where funds follow the students, comprehensive high schools become less willing to send students to area vocational schools because doing so involves a loss of funds — although they may still be willing to send high-cost students with special needs to the AVS. Further, because vocational programs tend to be expensive and often have small class sizes, it is tempting for schools to cancel them first. Also, when budgets are tight, vocational equipment is less likely to be modernized, which lowers the value and appeal of vocational courses.

In a small city and county district in an eastern state:

> The relationship between the local comprehensive high school and the [area vocational school] is strained, at best . . . . When a student decides to enroll in the half-day program at the [AVS], the home district loses half of its state aid money for that student. For a district as poor as this one, any loss in funds is something to be avoided.

In an eastern state:

> The two primary reasons given for the decrease in vocational enrollments were: (a) no student interest, and (b) the equipment needed to modernize some programs is far too expensive.

In an upper-middle class district in a western state:

> The high school had offered such vocational courses as electronics and auto body in the past, but in response to a strong feeling among parents . . . that their children will attend college, accompanied by a general budget crunch, the vocational courses and program offerings at the high school (with the exception of keyboarding, marketing, and drafting) have been virturally eliminated.

In a western city:

> In combination with downsizing and budget cuts, [increased university entrance requirements and the districts' corresponding increase in graduation requirements] have left vocational programs and career exploration vulnerable. Indeed, many vocational and career exploration programs, such as work-study credits, have been eliminated.

(The relation between increased academic requirements and vocational enrollments is an important issue, and is discussed in Chapter 10.)

In short, vocational programs appear to be more vulnerable than other secondary education programs to local economic conditions, including both the loss of jobs for which programs train students and the loss of educational funding that often results from a faltering local economy. The recession of the early 1990s thus probably has contributed to recent vocational enrollment declines.

Vocational Course Sequences

Common sense, the Perkins Act, and employment outcomes from vocational coursetaking all support the notion that vocational students should not simply take some minimal number of vocational courses, but should have extensive preparation in the occupational area for which they are training, including a sequence of introductory and advanced courses. In other words, it is important for students to complete a coherent vocational education **program**. The Perkins Act includes the development of a "coherent sequence of courses" as a required use of both state leadership and local basic grant funds.[24] As we will see in Chapter 15, vocational coursework concentrated in one area also leads to better employment prospects.

To examine the extent to which students take a "coherent sequence of courses," we looked at the number and level of courses taken within specific labor market areas. Even this formulation is a weak measure of a complete vocational education program, since a comprehensive program would include related academic courses (as specified in the Perkins Act) and possibly general work-preparation and school-to-work transition courses. However, this at least provides a measure of the necessary vocational core of a coherent program, as well as the part of a coherent program that has been demonstrably related to improved employment outcomes.

The number of credits students earn in first-level courses in specific labor market curricula and the number of credits earned in second-or-higher courses are shown in Table 4.8. The ratio of first to second-or-higher courses can be considered a measure of the extent to which students take sequenced vocational programs. As students take more introductory courses relative to upper level courses (decrease their sequencing), this ratio increases. For example, in 1982 and 1987 students took about 2.6 first-level courses for every upper level course they took, but in 1990, they took about 3.5 first-level courses for every upper level course; sequenced coursetaking decreased.

Table 4.8
Average Credits Completed in the Specific Labor Market Curriculum by Level of Course, 1982, 1987, and 1990

Level of Course	1982	1987	1990
All Students			
First	1.77	1.78	1.74
Second or higher	0.92	0.92	0.70
Average ratio of first to second-or-higher	2.64	2.71	3.46
Vocational Concentrators[a]			
First	3.27	3.17	3.56
Second or higher	1.88	2.04	1.70
Average ratio of first to second-or-higher	1.81	1.65	2.17

[a] Vocational concentrators are defined as students who have earned at least three credits within one specific labor market preparation area (agriculture, business, etc.).

Source: 1982 HSB, 1987 NAEP, and 1990 NAEP

To some extent, this decrease in course sequencing results from the fact that fewer students are taking a vocational program. But the decrease has occured even among "vocational" students. Table 4.8 shows that, as one would expect, vocational concentrators (those earning at least three credits within one specific labor market preparation area) take more upper-level courses relative to first-level courses than do students in general. But even among these vocational students, course sequencing has decreased, as the ratio of first- to upper-level courses increased from 1.8 in 1987 to 2.2 in 1990.

Other coursetaking data also suggest that students are taking less coherent sequences of vocational courses. Table 4.9 shows that students taking specific labor market courses in 1990 were less likely than those in 1982 to concentrate their coursetaking in one labor market area, or to take advanced courses within their chosen area when they did concentrate their courses. As a result, while 35 percent of the students earning at least three credits in specific labor market areas in 1982 had a concentration of three credits in one area with at least one advanced credit, only 27 percent met these criteria in 1990.

Table 4.9
Percent of Students Earning Different Combinations of Credits in Vocational Education, 1982, 1987, and 1990

	1982	1987	1990
Percent of students earning at least 3 credits in specific labor market courses	44	45	40
Percent of above who also earn at least 3 credits in one labor market preparation area (concentrators)	76	72	70
Percent of concentrators earning at least one upper-level credit	72	75	60
Percent of students earning at least 4 credits in specific labor market areas	31	32	28
Percent of above who also earn at least 4 credits in one labor market preparation area (advanced concentrators)	70	63	60
Percent of advanced concentrators earning at least two upper-level credits (specialists)	41	42	29

Source: 1982 HSB, 1987 NAEP, and 1990 NAEP

Thus, vocational coursetaking is decreasingly likely to constitute a coherent sequence of courses. This decline could reflect the effects of more students taking vocational courses for avocational reasons (such as our hypothesized college-bound computer enrollees). This type of change is not problematic. However, vocational coursetaking for avocational purposes does not explain the decline in advanced coursetaking among vocational concentrators. Reasons for this decline are not clear. There is some suggestive evidence in the case studies that increased academic requirements make it especially difficult for students to fit infrequently offered advanced vocational courses into their schedules. Researchers also found sites in which advanced vocational courses with few students were eliminated because of budget cuts. However, systematic evidence that would explain this tendency is not available.

Summary

As of 1990, declines in vocational coursetaking showed no signs of abating. Although these declines are occurring across the entire vocational curriculum, they have been particularly large among general labor market courses, such as typing and technology education. Within vocational labor market areas, enrollment declines have been concentrated in the two largest program areas, business and T&I. Finally, fewer students are taking a coherent sequence of vocational courses. Economic changes and education policies appear to play a large role in motivating these enrollment changes.

WHO TAKES VOCATIONAL EDUCATION?

In this section, we look at vocational participation for groups of students that are of particular policy relevance (and that are identifiable in the NAEP transcripts). These include male and female students, students of different race/ethnic groups, students with different academic grade point averages (GPAs), and students who are disabled. We also examine existing data on LEP students.

We first determine which groups of students take the most vocational education; this reveals where access issues may exist, and sets the stage for an examination of who is leaving vocational education. Since there is some concern that special population students may be concentrated in the lower paying service occupations and trades, we also look at the types of vocational programs in which these students are most likely to enroll. Finally, since the Perkins Act defines students in vocational programs that are nontraditional for their gender as special population students, and provides funds for programs to increase nontraditional enrollments, we examine these enrollments.

Vocational Participation Among Different Student Groups

The students who take the most vocational education are those who are not preparing for college.[25] This fact accounts for most of the group differences in vocational coursetaking. Nonetheless, there are some points worth noting about these differences, particularly when one separates occupationally related coursetaking (general and specific labor market courses) from consumer and homemaking education. Table 4.10 summarizes the data for this section.

Table 4.10
Average Number of Credits in Consumer and Homemaking, General and Specific Labor Markets, and All Vocational Areas, and Percent of Total Credits Earned in Vocational Courses, By Student Type, 1990

	Average Number of Vocational Credits Earned In:			
Student Type	Consumer and Home-making	General and Specific Labor Markets	Total Number of Vocational Credits	Vocational Credits as Percent of Total Credits
All students	.57	3.53	4.10	17
Sex				
Male	.33	3.90	4.23	18
Female	.79	3.19	3.98	17
Race/Ethnicity				
White	.55	3.58	4.13	18
Hispanic	.54	3.46	4.00	17
Black	.79	3.58	4.36	19
Asian	.32	2.58	2.89	12
Native American	.72	3.71	4.43	20
GPA				
Mostly As	.32	2.27	2.59	11
Mostly Bs	.50	3.19	3.69	15
Mostly Cs	.68	4.16	4.85	21
Mostly below C	.84	4.17	5.00	23
Disability status				
Disabled	.86	5.12	5.99	26
Not disabled	.56	3.49	4.05	17

Source: 1990 NAEP

Vocational Participation by Sex. Boys earn slightly more vocational credits than girsl, but because girls earn more of their vocational credits in consumer and home economics, boys earn notably more occupational credits. In 1990, boys earned an average of 3.89 credits in occupationally related vocational education, while girls earned 3.18. This difference can be only partially explained by girl's slightly greater enrollment in the college-prep track. In short, girls do not prepare for labor market work to the same extent as boys.

Vocational Participation by Race/Ethnicity. The pattern of vocational coursetaking by different racial/ethnic groups is slightly more complicated, but can be boiled down to three points. First, Asian students take dramatically less vocational education — both occupational and consumer/homemaking — than any other students. For example, Asian students earn on average only 2.57 credits in occupational course areas, compared to 3.53 for students in general. Second, black and Native American students earn more vocational credits, again both occupational and consumer/homemaking, than other students. While the overall average number of credits earned in vocational education is 4.10, the average for black students is 4.36 and for Native American students, 4.43. Finally, white and Hispanic students look very much alike in their vocational coursetaking, earning intermediate, average numbers of credits. Again, the college orientation of each of these groups explains some, but not all, of these differences.

Vocational Participation by GPA. Students with different GPAs differ greatly in their participation in vocational education. As one might expect, students with higher GPAs earn fewer vocational credits of any type than those with lower GPAs. For example, students whose grades are "mostly As" earn an average of 2.59 vocational credits, while those whose grades are "mostly below C" earn an average of 5.00 vocational credits. Here, the relationship to college orientation is clear.

Vocational Participation by Disability Status. Disabled students earn more credits in both occupational and consumer/homemaking vocational education than their non-disabled peers. Disabled students have the highest enrollments in vocational education of any of the student groups we examined: These students earn an average of 5.99 credits in vocational education, compared to 4.10 for students in general. This large difference undoubtedly reflects federal and other efforts to provide disabled students, who rarely go to college, with access to job training programs, which have been found to provide labor market benefits for these students.[26]

These findings are similar to those of the General Accounting Office (GAO), which also found higher participation rates for disadvantaged and disabled students than for "nontargeted" (non-special-population) students.[27] Vocational programs in community case study sites were also often characterized by higher enrollments of lower ability and disabled students.[28]

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Vocational Participation by LEP Status. The NAEP dataset includes a small sample of students who were classified as LEP in the 12th grade. Clearly, many of these students had entered the U.S. public schools during the latter high school years. As a result, at least some of them are likely to have had very little time to take vocational classes as they attempted to meet high school graduation requirements. It is thus not surprising that they earned fewer vocational credits (an average of 2.81) than most other students.

However, more representative LEP student samples suggest that these students participate in vocational education at rates equal to or higher than students in general. The GAO found that LEP students participate in vocational education at the same rate as non-special needs students,[29] while preliminary analyses of the NELS data (which includes students identified as LEP in grade 8) show higher rates of participation among LEP students than among English proficient students (an average of 4.23 versus 3.71 vocational credits earned). Since the transcript data seem a more reliable source than administrator reports (used by the GAO), we speculate that LEP students have higher-than-average rates of vocational participation. Final NELS results, to be included in our Final Report, will explore this further.

In sum, special population students appear to be disproportionately concentrated in vocational education. Preliminary NELS data demonstrate this succinctly: While 34 percent of the class of 1992 were special population students (disabled, disadvantaged, or LEP), 43 percent of the vocational credits earned by this class were earned by special population students.

As discussed above, a critical quality issue is the extent to which students are taking a coherent sequence of vocational courses. Hence we examined the percentage of vocational students in each of these groups whose coursework meets the definition for a vocational concentrator and specialist, as defined in Table 4.9.

In general, there were few differences among the students in this respect. In each group, about the same percentage of vocational students are concentrators (earn three credits within one labor market area) and about the same percentage are specialists (earn four credits with two advanced credits in one labor market area). The ratio of upper level to lower level credits is also about the same for most groups of students. (These data are summarized in Appendix Table A-4.4.)

There are, however, two exceptions to this pattern. The two student groups that take the least vocational education, Asian and A-average students, are less likely than others to be vocational concentrators or specialists, or to take upper-level courses. These students may have a different agenda for vocational coursetaking. More of them may be taking computer or other technical courses as basic preparation for college coursework.

Vocational Participation in Specific Labor Market Areas

Anecdotal evidence, as well as findings from the previous National Assessment, suggest that special population students, particularly disabled and educationally disadvantaged students, may be overly represented in low-skill, lower paying areas within occupational home economics and the traditional trades.[30] In this section, we examine the coursetaking of disabled and educationally disadvantaged students to determine the extent to which these students are concentrated in particular areas.

To control for the fact that these special population students earn more vocational credits than others, we calculated a ratio: the number of credits each special population group earned in a program area to the number of credits earned by its non-special-population peers. To illustrate, the ratio for disabled students in agriculture is 2.79, indicating that disabled students earn 2.79 agriculture credits for every one agriculture credit earned by non-disabled students. Comparing these ratios across program areas shows the extent to which each special population group is more or less likely than other students to earn credits in that area.

The ratios show that educationally disadvantaged and disabled students do earn relatively high numbers of credits in occupational home economics and T&I courses (see Table 4.11). But educationally disadvantaged students also earn relatively high numbers of credits in marketing, as do disabled students in agriculture and health. Finally, both special population groups are relatively less likely to earn credits in technical/communications, the most clearly "high-tech" vocational program area; disabled students earn relatively few credits in business as well.

The broad occupational categories used here do not necessarily equate to low-wage or low-skill occupations, but in combination with other findings, they do suggest a greater concentration of disabled and disadvantaged students in training for lower status occupations. For example, the previous National Assessment found that within home economics and T&I, disabled and disadvantaged students tend to be concentrated in food service, cosmetology, and building maintenance programs.[31] Across community case study sites in this assessment, researchers found that special needs students were concentrated in this food service, auto body, and the metalworking trades. The summary for the case studies noted that "some health-related courses, such as home health aide are considered by some communities to be the salvation of at risk populations in terms of job possibilities, but they are seen by others as leading to dead-end jobs. One district refuses to teach such courses."[32]

It is difficult to know how to interpret these data. Are students being inappropriately channeled into "low-tech," low-skill vocational areas — or do these patterns represent realistic matches between students' abilities and

Table 4.11
Ratio of Average Number of Credits Earned in Each Vocational Labor Market Area by Special Population Students to Non-Special Population Students[a]

Student Type	Agri-culture	Bus-iness	Market-ing	Health	Occup. Home Ec.	T&I	Tech/ Comm
Educationally disadvantaged (1)	0.91	0.94	1.68	1.09	1.70	1.97	0.49
Educationally disadvantaged (2)	1.46	1.05	2.20	1.50	2.14	2.67	0.56
Disabled	2.79	0.41	0.94	2.25	2.75	1.99	0.17

[a] We originally classified only the Below C-average students as educationally disadvantaged (ratio (1)). However, the coursetaking patterns for C-average and Below C-average students were very similar to each other and different from those for A- and B-average students. Since the data suggested distinct coursetaking patterns for A and B students versus C and Below C students, we also included ratios for this classification (ratio (2)).

Source: 1990 NAEP

educational programs? Most likely, both factors are operating to some extent. At the very least, these data suggest that schools should actively attempt to broaden the courses taken by disabled and disadvantaged students, particularly in high-tech program areas.

Nontraditional Enrollments

In accordance with the Perkins Act's goals of improving the vocational education opportunities for all students and the competitiveness of the workforce, the act seeks to foster the enrollment of students in vocational programs that are "nontraditional" for their gender (e.g., auto mechanics for female students, nusing for male students). Monitoring nontraditional student enrollments allows us to determine the extent to which progress is being made in this area. These data do not, however, indicate the effectiveness of schools' Perkins (or other) sex equity efforts, as nontraditional enrollment trends reflect the effects of innumerable pressures on students' career choices.

With this caveat in mind, we examine changes in nontraditional enrollments in this section, focusing on coursetaking in specific labor market program areas, where this issue is most pertinent. In particular, we examine the extent to which vocational enrollments in specific labor market areas are sex stereotyped, and the extent to which they have become less so in recent years.

Table 4.12 lists vocational labor-market course areas in order from those with the heaviest concentration of male students to those with the heaviest concentration of female students. For each program area, the table lists the percentage of students who are male, and the percentage of vocational concentrators (those earning at least three credits in the area) who are male.

Table 4.12
Percent of Students Enrolled in Each Vocational Program Area Who are Male, and Percent Earning at Least 3 Credits in each Program Area Who are Male, 1982, 1987, and 1990

	Number of Credits Earned					
	1982		1987		1990	
	Any	3 or More	Any	3 or More	Any	3 or More
Trade and industry	79	94	79	91	78	91
Agriculture	71	88	76	83	72	77
Technical/communications	57	72	55	76	53	66
Marketing	45	42	41	38	40	40
Business	35	9	38	16	41	18
Health	34	13	27	7	34	13
Occupational home ec.	19	15	24	20	21	18

Source: 1982 HSB, 1987 NAEP, and 1990 NAEP

The table reveals three important points. First, most vocational program areas have sex stereotyped enrollments. Agriculture, trade and industry, and (to a lesser extent) technical/communications have predominantly male enrollments, while business, health, and occupational home economics have predominantly female enrollments. Only marketing has relatively balanced enrollments.

Second, sex stereotyping is greater among students who concentrate in an area (and are thus more likely to be preparing for jobs in that area) than it is among all students taking courses in an area. For example, 78 percent of the students who earned any credits in T&I courses in 1990 were male, but fully 91 percent of those who concentrated in this area were male. Similarly, while 66 percent of the students who earned credits in health were female, 87 percent of health concentrators were female.

Third, in almost every area, vocational enrollments in general show less change in sex distribution over time than do the enrollments of vocational concentrators. Agriculture shows the clearest difference: Agriculture enrollments in general have inched from 71 percent to 72 percent male, but agriculture concentrators have changed from 88 percent to 77 percent male. This suggests that trends in overall enrollments understate the extent of change among students who are truly "vocational."

Altogether, these data suggest that progress in vocational sex equity has been slow and uneven — but perhaps this is only to be expected, given the nature of the problem. It would be, in fact, quite surprising to find a sudden, large shift in these enrollments.

What is less encouraging is the uneven nature of the shifts. Only three of the six labor market areas with sex-stereotyped enrollments show any reduction in sex bias from 1982 to 1990.[33] Of the three predominantly male program areas, two (agriculture and technical/communications) are enrolling significantly more female concentrators, while of the three predominantly female program areas, only business shows a shift toward more male enrollments. Interestingly, the shift in business enrollments appears to be occurring mainly in business support — the predominantly female section of the business program — rather than in business management, the more egalitarian section of the business program.[34]

However, it is encouraging that most change is in the direction of traditionally male fields gaining more female concentrators, since increasing women's employment options is the underlying intent of vocational sex equity. It remains to be seen if female enrollments in the traditional trades will eventually increase as well.

WHO IS MOVING OUT OF VOCATIONAL EDUCATION?

We know that students in general are taking fewer vocational courses. But are all students "leaving" vocational education at the same rate, or are some types of students abandoning vocational education to a greater extent than others? In other words, for which students has vocational education lost its appeal?

Students do differ in the extent to which they have reduced their vocational coursetaking (see Table 4.13 and Appendix Table A-4.5). Among sex and race

Table 4.13
Average Number of Vocational Education Credits Earned, By Student Type, 1982, 1987, and 1990

Student Type	1982	1987	1990
Sex			
Males	4.62	4.52	4.23
Females	4.66	4.36	3.98
Race/Ethnicity			
White	4.54	4.52	4.13
Hispanic	5.27	4.29	4.00
Black	4.83	4.47	4.36
Asian	3.14	2.92	2.89
Native American	5.11	4.70	4.43
GPA			
Mostly As	3.23	2.90	2.59
Mostly Bs	4.39	4.10	3.69
Mostly Cs	5.26	5.02	4.85
Mostly below C	4.96	5.08	5.00
Disability Status			
Disabled	4.81	5.99	5.99
Not disabled	4.62	4.37	4.05

Source: 1982 HSb, 1987 NAEP, and 1990 NAEP

groups, girls reduced their vocational coursetaking more than boys, and Hispanic students reduced their coursetaking more than other students. The differences by sex are not very large, but have had the net effect of changing enrollments so that boys earn slightly more vocational credits than girls, rather than vice versa. The changes by racial/ethnic groups have evened out vocational coursetaking among these groups, and moved Hispanic students from those earning the most vocational credits to those earning less than all groups except Asians. The reason for the relatively large decline among Hispanic students is unclear. Anecdotal evidence suggests that efforts by Hispanic advocates to encourage college attendance among Hispanic students may be a factor.

There are also differences in exit rates by educational disadvantage and disability status. Students whose grades are mainly As and Bs have reduced their vocational coursetaking much more than have C and Below C students. In fact, Below C students slightly increased the average number of vocational credits they earn. Even more striking are the differences by students' disability status: Disabled students have greatly increased their vocational coursetaking, while non-disabled students have reduced theirs. In short, vocational courses are increasingly being taken by disabled and educationally disadvantaged students, while other students are taking less vocational education.

The student groups whose vocational participation has declined most dramatically are those who have traditionally taken less vocational education. This might suggest that the exit pattern reflects only movement at the margins — fewer students "dabbling" in the vocational curriculum, while those who have always had a strong commitment to vocational education remain. To test this hypothesis, we restricted the analysis to vocational concentrators — those students who take at least three courses in a specific labor market area. If the exit pattern is the same among concentrators as among all students, then it is not merely the marginal students who are leaving. Table 4.14 shows that this is true — the greater decline in vocational coursetaking among high-GPA students and non-disabled students is as strong for vocational concentrators as it is for students in general. Thus, the greater shift of these students out of vocational education seems to reflect less interest in pursuing (or perhaps less flexibility to pursue) a full vocational education program, as well as less interest in lower levels of vocational coursetaking.

ACADEMIC, VOCATIONAL, AND "GENERAL TRACK" STUDENTS

As discussed earlier, some secondary students focus their coursetaking on preparation for college, others on job preparation, while still others have no apparent focus; they prepare for neither of these alternatives. How many students are in each of these groups? The answer to this question provides further insight into the role of vocational education within the larger educational enterprise. Also, since the Perkins Act emphasizes strong academic as well as vocational skills, it is useful to compare the academic coursetaking of vocational students to that of other secondary students. This section addresses these issues by comparing vocational, college-bound, and "general track" students.

For this analysis, students were classified based on the following criteria:

- Advanced academic: Students who earned at least 4 credits in English; at least 3 credits in mathematics, with at least one credit in algebra or higher mathematics; at least 3 credits in science with at least one in a physical science; and at least 2 credits in a foreign language. These criteria approximate current typical 4-year college entry requirements, which are much higher than those used in

Table 4.14
Percent of Students Who Are Vocational Concentrators, By Student Special-Population Category, 1982–1990

Student Type	1982	1987	1990	Absolute Change, 1982–90	Percent Change, 1982–90
All Students	34	32	28	-6	-18
GPA					
Mostly As	20	15	13	-7	-35
Mostly Bs	31	28	24	-7	-23
Mostly Cs	40	38	35	-5	-13
Mostly below C	36	42	35	-1	-4
Disability Status					
Disabled	32	44	43	+11	+34
Not disabled	34	32	27	-7	-20

Source: 1982 HSB, 1987 NAEP, and 1990 NAEP

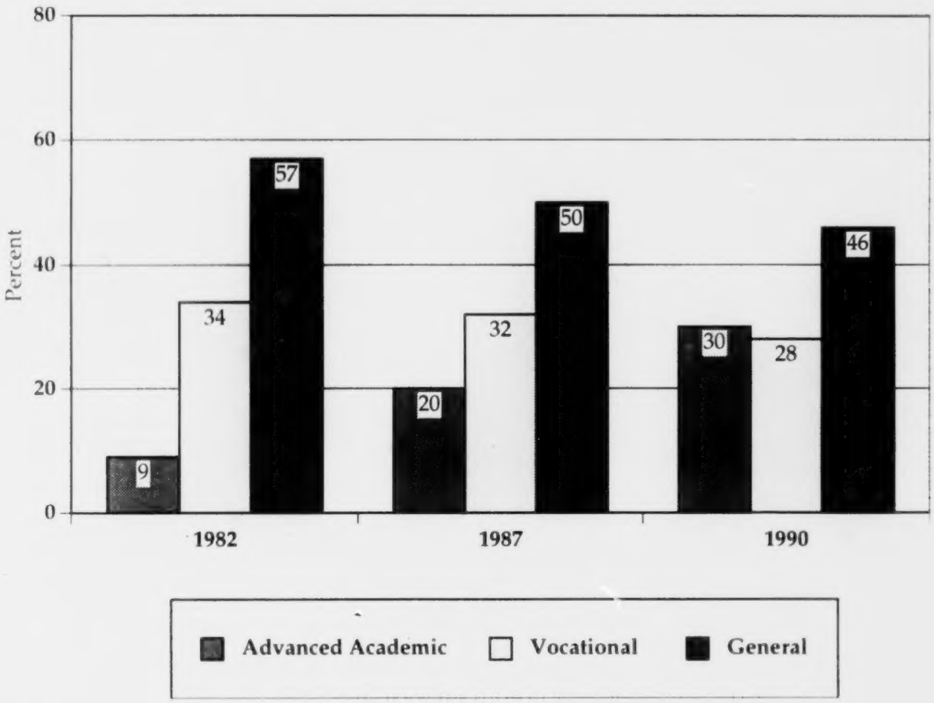
earlier years. As a result, this category underestimates the size of the college-bound pool in earlier cohorts.

- Vocational completers: Students taking at least 3 credits within a single specific vocational labor market area (agriculture, business, etc). This concentrator criterion approximates the definition many schools use to define a vocational completer.
- General track: Students who meet neither of the above criteria. These students can be considered to be preparing for neither college entry nor entry into a skilled or semi-skilled occupation.

It is important to recognize that these are constructed categories. While they reflect underlying realities in the types of educational programs students pursue, they compartmentalize coursetaking patterns that are inherently much more complex and indistinct. We also do not mean to imply by these distinctions that schools should define their students in these terms; they are merely useful analytic tools.

By these definitions, 30 percent of 1990 high school graduates were advanced academic students, 28 percent were vocational students, and the largest proportion — 46 percent — were general track students (see Figure 4.6); even among those students who are not preparing for college, the general track is more popular than concentration in vocational education.

Figure 4.6
Percent of Students in Advanced Academic, Vocational, and General Tracks, 1982, 1987, and 1990



NOTE: Columns sum to more than 100 because the advanced academic and vocational tracks are not mutually exclusive.

Source: 1982 HSB, 1987 NAEP and 1990 NAEP

The general track is not just the most common curriculum for all students, but for every demographic and special population group we examined, except A-average students (see Appendix Table A-4.6). Even among disabled students, who earn the highest number of vocational credits, vocational concentration is less popular than the general track. If students are unclear of their career goals, this preference may represent a rational choice. However, if they are clear, their choice of the general track over the vocational track seems unwise, since, for those who obtain jobs related to their training, vocational training has better payoffs than no vocational training (see Chapter 15).

In line with recent shifts in coursetaking, the proportion of students in each of these categories changed dramatically from 1982 to 1990. As Figure 4.6 shows, the proportion of students in the general and vocational tracks has declined, while the proportion in the "college-prep" track has increased from only 9 percent in 1982. As mentioned above, this increase most likely reflects the increases in college entry requirements during this period, more than an increase in the proportion of students preparing for college.

Although the vocational track appears to have lost students to the academic track, there is a small but increasing overlap between the vocational and academic tracks. In 1982, only .4 percent of vocational students met the advanced academic course requirements, but by 1990, 2.8 percent met these requirements. While this is a very low proportion, it is indicative of an overall trend for increased academic preparation among vocational students, as we will see below.

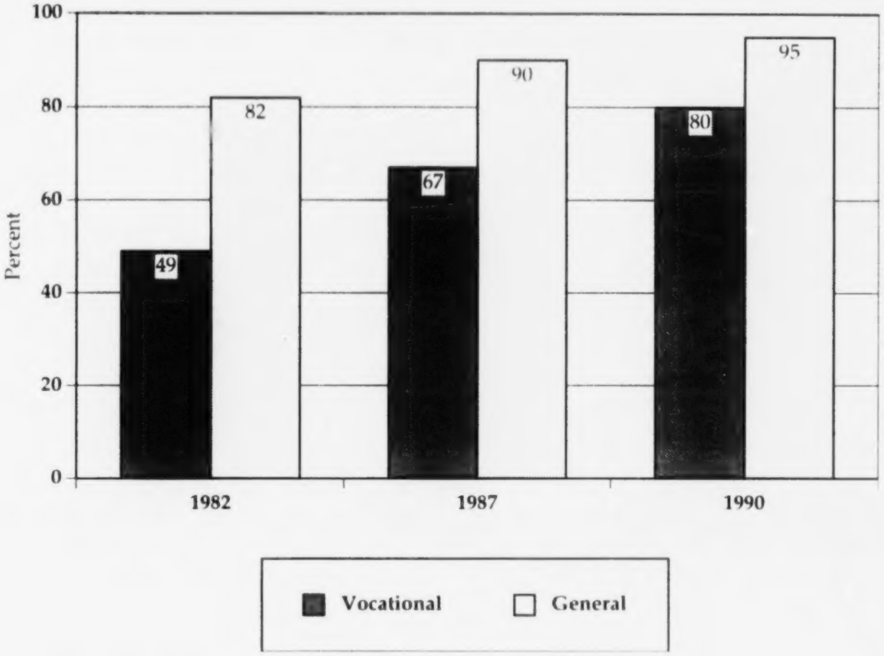
Academic Coursetaking of Vocational Track Students

The Perkins Act stresses the importance of a strong academic foundation for vocational students. In this section, we examine these students' academic coursework, focusing on two questions: How much academic coursework do vocational students take, and how does their academic coursetaking compare to that of other students?

For this section, we define a basic academic program to include at least 12 credits in English, mathematics, science, and social studies. All academic track students necessarily meet this criterion, but while 95 percent of general track students also complete a basic academic program, only 80 percent of vocational students do. This academic coursetaking pattern is consistent with data on postsecondary completions (reviewed in Chapter 5), which show that community college students who were vocational students in high school have lower completion rates than do those who were academic or general track students. Vocational students' lower level of academic coursetaking may leave them less prepared for succeeding in a community college program.

However, vocational students' academic coursetaking is improving. Figure 4.7 shows that while the proportion of both general and vocational students who complete a basic academic program has increased, the proportion of vocational students has increased at a faster rate. Thus, the academic coursetaking gap between (advanced) academic, general, and vocational students is closing, and is closing faster for vocational students than for general students.

Figure 4.7
Percent of Vocational and General Track Students Meeting "Basic Academic" Criterion, 1982, 1987, and 1990



Source: 1982 HSB, 1987 NAEP, and 1990 NAEP

Examining academic coursetaking in more detail reveals the extent to which vocational students' deficits and gains are concentrated in particular subjects, rather then spread throughout the curriculum. Figure 4.8 shows the number of credits earned in different academic areas by students in the three tracks (see also Appendix Table A-4.7).

In 1990, vocational students earned an average of 3.9 credits in English, 2.8 in mathematics, 2.3 in science, 3.2 in mathematics, and 0.4 in computer science (a subcategory of mathematics). In all these subjects except computer science, vocational students earned fewer credits than academic and general track students. In contrast, general track students earned fewer credits than academic students only in mathematics and science. Not surprisingly, it is in these two "gateway" subjects that both general track and vocational students have the greatest coursetaking deficits relative to their college-bound peers. This deficit widens substantially for advanced mathematics coursetaking, but only slightly for advanced science courses.

Figure 4.8 also shows that vocational students have gained on academic and general-track students in English, mathematics, computer science, and science, although they have lost gound in social studies. Vocational students' gains have been particularly large in mathematics and science, the two subjects in which they were initally weakest. Because of this initial deficit, their gains have been primarily in lower-level courses; vocational students' courstaking gains in advanced mathematics and science have been smaller.

These coursetaking gains appear to be due to increased graduation requirements, which necessarily have a greater impact on those students whose coursework was initially weakest. It is doubtful that vocational students would have made these gains otherwise, especially given the previously reviewed findings on the types of students who are moving in and out of vocational education.

Implications of Coursetaking Patterns. It is not surprising to find that vocational students earn fewer academic credtis than academic students. But why do they earn fewer academic credits than general track students? Three explanations seem likely. First, vocational students have less room in their schedule for academic courses, and so might take fewer academic courses by necessity. Second, to the extent that vocational education serves more special needs students than do other programs, a lower level of academic coursetaking is (to some extent) unavoidable, due to the lower achievement and motivation levels among these students. Third, vocational students may simply choose to take fewer academic courses, beyond whatever is required for high school graduation. Each of these explanations has different policy implications, so it is important to know the extent to which each is operating. While these explanations cannot be sorted out with the NAEP data, analyses currently being conducted with the National Education Longitudinal Study (NELS) may shed light on this issue.

Regardless of the cause, the relatively low level of vocational students' academic preparation indicates that these students are graduating from high school with fewer of the basic academic skills and knowledge than their peers obtain. This may put them at a disadvantage if and when they must compete for jobs other than entry-level positions. It clearly reduces their prospects for postsecondary education.

"DUMPING" AND THE STATUS OF VOCATIONAL EDUCATION

We have seen that vocational enrollments are highest among disabled and educationally disadvantaged students, that these students are over-represented in vocational education, and that their representation is increasing. In some ways, these are positive developments. To some extent they reflect an elimination of barriers to vocational participation for special needs students. Also, vocational classes with diverse student enrollments may provide social benefits in the form of increased opportunities for student interaction with a broader cross-section of peers. Further, secondary vocational programs have demonstrated benefits for

Figure 4.8
Average Credits Earned in Different Academic Subject Areas by Vocational, General, and Academic Students

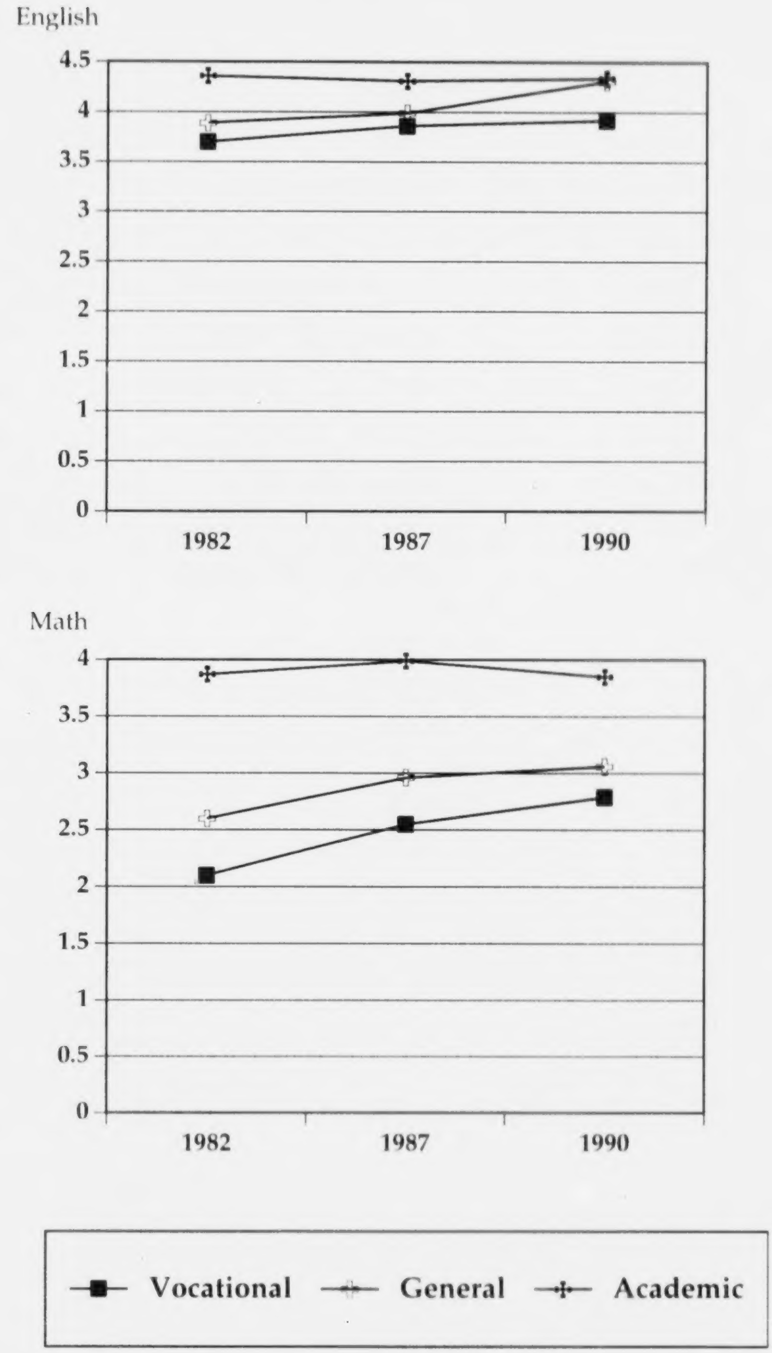


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Figure 4.8 (continued)
Average Credits Earned in Different Academic Subject Areas by Vocational, General, and Academic Students

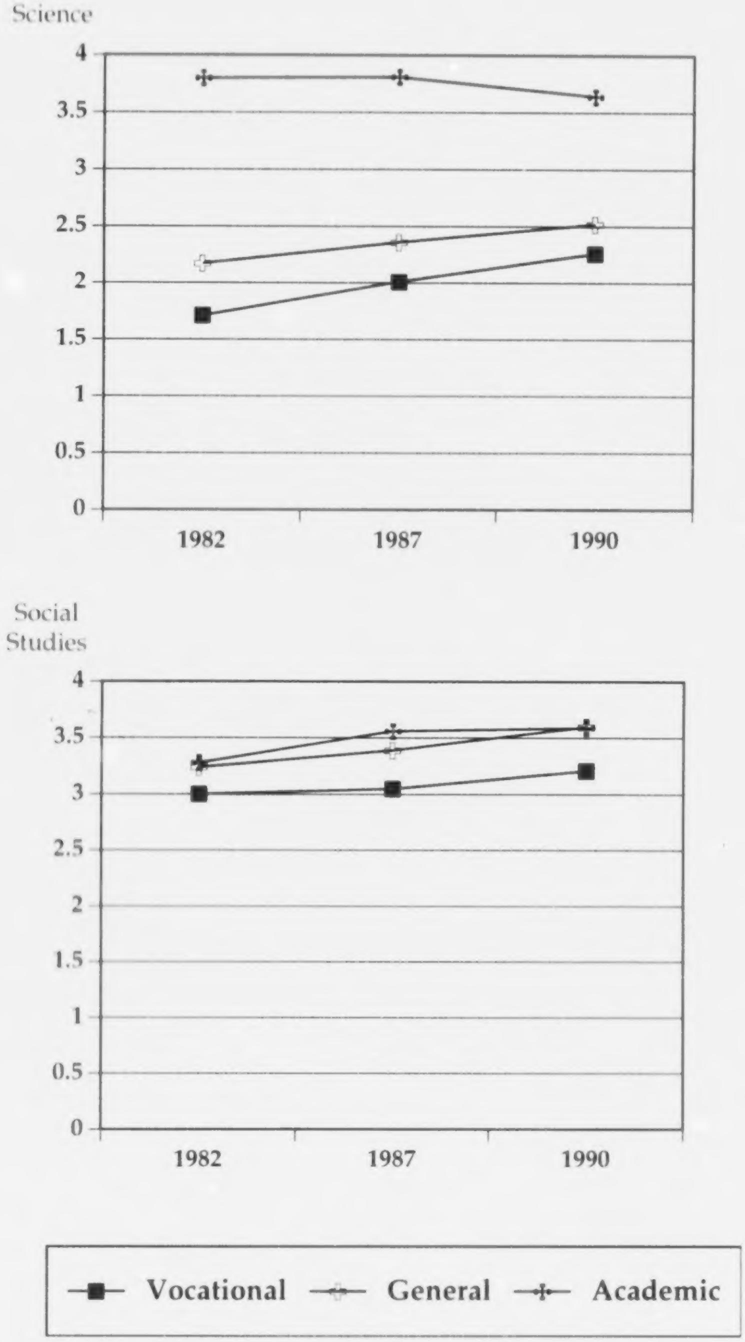

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Figure 4.8 (continued)
Average Credits Earned in Different Academic Subject Areas
by Vocational, General, and Academic Students

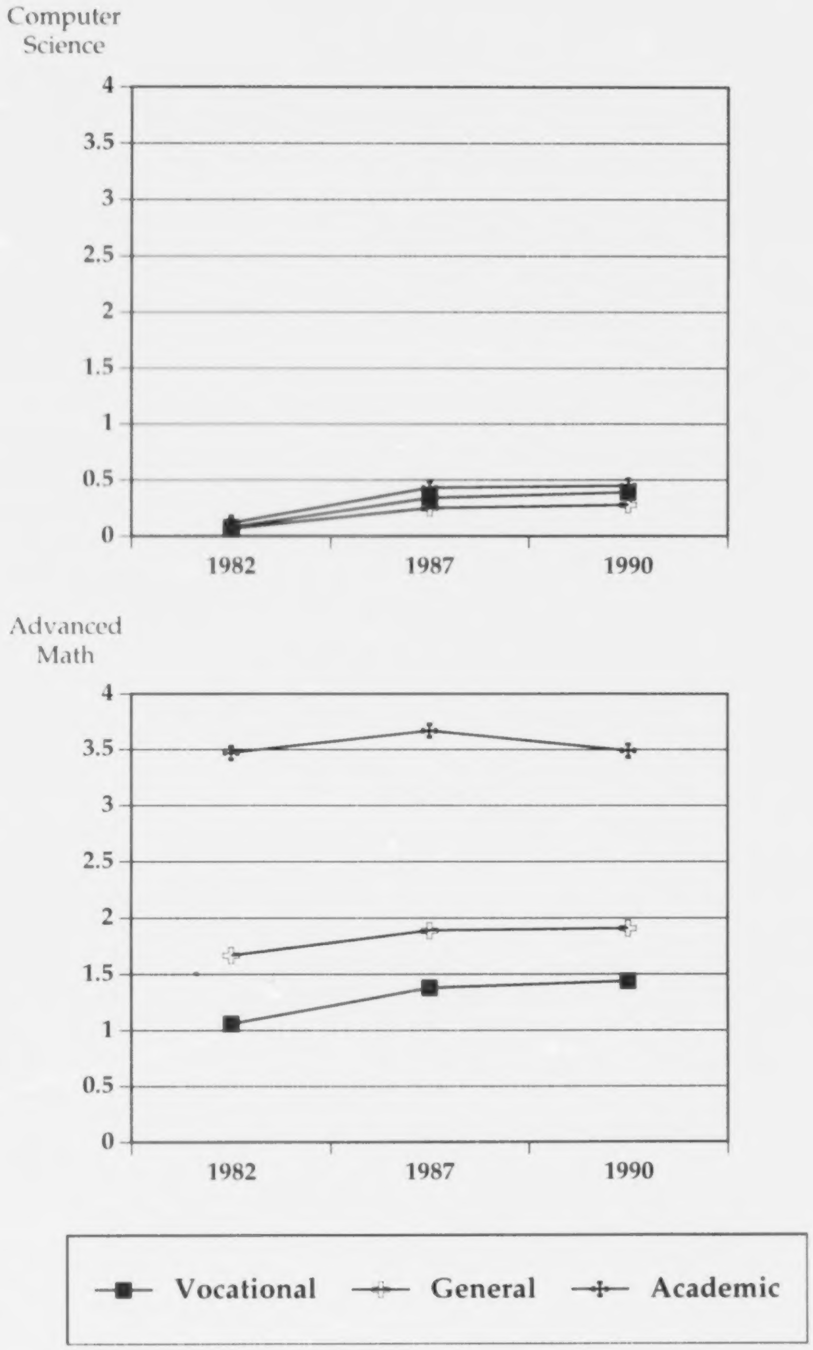

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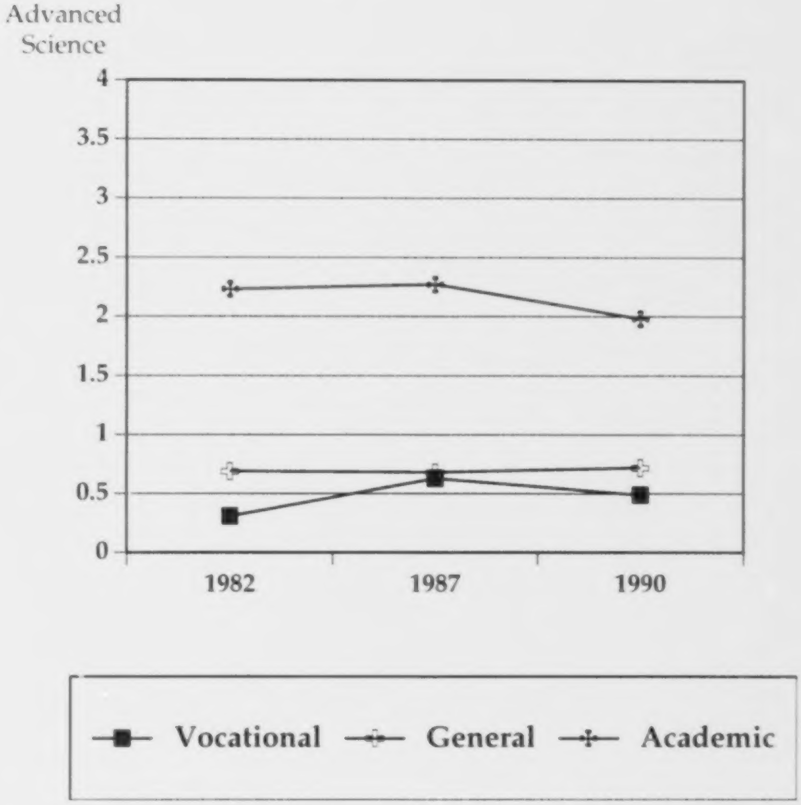
Figure 4.8 (continued)
Average Credits Earned in Different Academic Subject Areas by Vocational, General, and Academic Students



Source: 1982 HSB, 1987 NAEP, and 1990 NAEP

disabled students: Vocational coursetaking has been shown to improve their employment outcomes (see Chapter 15).

On the other hand, there is reason to believe that many special population students are being channeled into vocational education for reasons incidental to their best educational interests. This inappropriate placement of students is commonly called "dumping." The practice is an old one, but it seems to be increasing. As vocational enrollments decline, pressures to maintain enrollment levels encourage programs to seek or accept students irrespective of the students' need for vocational education. Further, the Perkins equal access provisions, funding requirements for vocational districts, and the requirement that districts receiving basic grants actively recruit special populations to vocational programs encourage districts to maximize the participation of these students in vocational education. We believe that the question of whether such placements are in the best interests of the students is too often a secondary consideration.

How large a problem is this? It appears that although inappropriate student placements are not ubiquitous, they are widespread. In the Omnibus Surveys, almost half of all school adminstrators (44%) and over half of all vocational school administrators (55%) rated "placing problem students into vocational education programs, regardless of appropriateness" as a moderate to serious problem in their school. In addtion, 37 percent of school administrators agreed that "vocational education is viewed as a dumping ground for educationally disadvantaged or other special needs students." This issue is ranked as one of the most serious problems in vocational education by both administrators and teachers (see Chapter 8 for data on teachers).

Evidence of dumping and its effects abound in the community case study sites (quotes without page references are from unpublished individual case study reports; all others are from the case study summary report):[35]

> In the vocational magnet in a midsize southern district, health, data processing, and computer programming are seen as good programs, but the classess . . . at the comprehensives are seen as better because the students are better: "If they can't read we send them to the vocational school." (p. 32)
>
> Interviews . . . reveal a clearly adversarial position, with the academic high school appearing to be hanging on to good students as tightly as possible and the vocational center teachers believing that the "dumping" is getting worse every year. Turf has become a concern in a small central/midwestern community where the local districts do not want the half-day area school to teach academics but do want to "dump" their poorest students there. (p. 23)
>
> [At one college-oriented site, we] gained the impression that vocational education was seen by some students and staff as being for special needs students, particularly those on IEPs . . . . The perspective of the districts is that generally only special needs students are going to participate actively in [vocational education]. This perspective is echoed by the [vocational education] department chair, who agreed strongly that [vocational education] is seen as a dumping ground for special needs students.
>
> The current situation, in which the vocational center staff believe they are getting poorer and poorer students and becoming a dumping ground, is in their view causing fewer and fewer prerequisites to be applied; rather, the courses are restructured to fit the clientele, students are steered into courses the counselors and

> teachers feel they can handle, and a significant percentage of students must go through pre-vocational and remedial training prior to vocational assignment.

School counselors often are perceived to encourage the "dumping" process:

> A small midwest city uses tests to "dump" less-prepared students into the area vocational school, and counsels better students and class leaders into other electives. (p. 35)
>
> In a small eastern community, the vocational area school complains that the comprehensive school counselors will not direct business students their way because this competes with the business courses given by the comprehensive; on the other hand, they say, all the disruptive students are directed to the vocational school. (p. 35)
>
> The great push by these communities and their states is for upgrading academic studies and preparing the maximum number of students for college admission. Thus, it is not surprising that overloaded counselors on the one hand give short shrift to vocational skill needs, and on the other subtly push the less able students out of comprehensive schools that compete for record percentages of graduates and college acceptances. (p. 35)

Of course it is possible that other groups, such as parents, counselors, and representatives of special populations, do not view these placements as being made irrespective of the best interests of the students. However, we think the weight of evidence suggests that factors such as funding, turf, supplemental service availability, and the interests of other students play too large a role in the placement of special population students in vocational education.

Inappropriate placement is not the only problem with the broad movement of special population students into vocational education. We have seen that as their participation in vocational programs increases, that of higher achieving students decreases. Evidence from the case studies suggests that one reason higher achieving students avoid vocational education is to avoid stigmatization.

> It was also noted in many districts that classes that attract large numbers of at-risk students, particularly the disabled, come to be seen as both lower quality and lower status .... It is ironic that these classes, because of the federal presence, are often among the better equipped and better staffed classes .... Nonetheless, it was noted in a number of districts that classes have "tipping points," points at which the better students refuse to come because of a perceived critical mass of at-risk students. (pp. 32–33)

> Students will not select vocational courses or schools with negative stigmas . . . . In one district, students will attend the vocational school but will not take the bus to get there because the mentally handicapped who attend are required to ride the bus. (p. 36)
>
> Applied academic classes, seen as the solution to mixing academic and vocational content and students, are ironically becoming seen by better students as reputationally inferior because of their success in drawing less able students. (p. 31)
>
> Classes are viewed as being lower quality if they attract less able students, or heavy proportions of disabled students, with students being described as less able if they take the less technical courses. In part, these are self-fulfilling prophecies, so the more capable staff are aware of this danger and work hard to counter the stigma. However, teachers note that classes full of the less able students must be "dumbed down" or "taught down" in order to make any progress at all. (p. 30)

Thus the growing concentration of special population students in vocational programs, especially those in separate vocational schools, may lead to their increasing isolation and stigmatization. Lowering standards in response to the advent of more special population students may further aggravate the problem. In these cases rational decisions may complement prejudice in motivating more able students to avoid or leave vocational programs. Even if the programs are well supplied with staff, equipment, and materials, increasing isolation from the mainstream and an inappropriate level of instruction would pose significant risks for these students.

In the long run, efforts to integrate academic and vocational education may counteract these tendencies. However, Chapter 12 shows that integration today is rudimentary, and we have seen that the concentration of special population students in vocational programs, and the departure of other students, is substantial and growing. It may be that the next Perkins Act should modify the broad mandate to increase the participation of special population students in vocational education. We will examine this problem in the coming months and make appropriate recommendations in the Final Report to Congress.

CONCLUSION

Our findings support the previous Assessment's findings that the greater concentration of area vocational schools in suburban areas limits the access that special population students have to them. These are the students who tend to take the most vocational education, and the specialized facilities of AVSs are least accessible to them. Otherwise, access to vocational programs does not appear to be a problem for special population students, who enroll in vocational education at rates equal to or higher than other students, and benefit from numerous supplemental services that may not be available elsewhere (see Chapter 6).

Student enrollment trends show a give-and-take between academic and vocational courses. In the 1970s, while student enrollments were increasing, vocational coursetaking increased and academic coursetaking decreased. But in the 1980s, academic coursetaking increased while vocational coursetaking decreased and total student enrollments declined, creating a sharply reduced demand for vocational instruction. As of 1990, vocational enrollments continued to decline. This occurred not just among students who browse in vocational education (that is, take only a few courses), but also among those who take a large number of vocational courses and who concentrate in a vocational program area.

Declines within the vocational curriculum have been mainly limited to general job-preparation courses and two specific program areas, business and the trades. One of the smaller program areas, technical and communications, has had enrollment increases. These changes seem to correspond to labor market trends, suggesting that secondary vocational enrollments are responsive to labor market conditions, although other explanations are also possible. For example, there is evidence that local economic conditions, such as a loss of manufacturing jobs and education budget cuts, can reduce vocational enrollments by lowering course demand, course availability, or the quality of vocational offerings.

Also, fewer vocational students appear to be taking a "coherent sequence" of vocational courses; fewer students who take vocational education concentrate their coursetaking in a specific program area, and fewer vocational students are taking upper-level courses. Since concentrated coursetaking enhances some labor market outcomes, and course sequencing is stressed by the Perkins Act, schools need to better address the structure of students' vocational coursetaking.

Most secondary vocational programs continue to be highly sex-typed. Only marketing has fairly balanced enrollments, with enrollments in the trades, agriculture, and technical/communications being mostly male, and business, health, and occupational home economics being mostly female. Not surprisingly, sex stereotyping is higher for students who concentrate in an area (take at least three courses) than it is for students who take any courses in an area. But increases in nontraditional vocational enrollments are evident only for concentrators, suggesting progress among students who are truly vocational. Women have increased their representation in agriculture and technical/communications, but not in the trades, while men have increased their representation in business. Given the weight of forces that pressure students to follow traditional career paths, these changes are quite encouraging. However, the lack of change in the trades, the program area enrolling the highest proportion of boys, shows that progress is still uneven.

Vocational education as a whole is more popular among some types of students than others. Boys take more vocational education than girls, partly because boys are less likely to be college-bound, but also for other (unknown) reasons. Black and Native Americans also take relatively high amounts of vocational education, while Asians take less vocational education than any other groups. These enrollment patterns reflect each group's likelihood of attending college, with those more likely to attend college taking less vocational education.

The Perkins Act focuses on the provision of vocational education for disabled, disadvantaged, and LEP students. In earlier years, these groups (at least disabled students) participated in vocational education at low rates. But in 1990, disabled and (educationally) disadvantaged students participated in vocational education at higher rates than other students, and LEP students participated at rates equal to or higher than that for English proficient students.

Disabled and disadvantaged students also tend to be over-represented in certain vocational fields. Both are over-represented in occupational home economics (usually food service) and the trades, and are also under-represented in the most highly technical vocational area, technical/communications. It is unclear to what extent these enrollment patterns represent appropriate matches between students' abilities and interests and program content, or an inappropriate restriction of student choice.

The decline in vocational enrollments also differs among student groups. Among students with different educational achievement levels (measured by grades), those at the highest levels took much less vocational education in 1990 than they did in 1982, average-achieving students took somewhat less, while low-achieving students took the same amount. Disabled students are the only students found to have increased their vocational coursetaking. (Data on LEP students are not available.) Thus, the **proportions** of vocational credits earned by low-achieving and disabled students have increased.

These findings show that secondary vocational programs are increasingly serving special needs students, while serving fewer "regular" students. In light of this, is not clear that federal legislation should continue to try to steer more special population students into vocational education. This goal is especially questionable given the "dumping" of special needs students into vocational programs, which currently appears to be a problem in over one-third of schools. The broad movement of special needs students into vocational education and the departure of other students may also lead to the increasing isolation and stigmatization of these programs.

Finally, vocational students earn fewer credits in all academic subject areas (except computer science) than do other students, both college-bound and non-college-bound. Increased high school graduation standards have narrowed this gap, but notable differences still exist. If vocational programs provide students with other long-term benefits that are not provided by a general track curriculum, these academic differences may not be too important. However, at present, these benefits appear to accrue only to some vocational students, and even these benefits could be strengthened by a more rigorous academic foundation.

ENDNOTES

1 Sec. 403 (b) (4).

2 Another way to evaluate access is to examine the extent to which support services are available for vocational special needs students; we do this in Chapter 6 on "State and Local Responsibilities Concerning Special Populations."

3 Hayward, B.J., & Wirt, J.G. (1989), National Assessment of Vocational Education, Final Report, Vol. V., *Handicapped and Disadvantaged Students: Access to Quality Vocational Education*, Washington, DC: U.S. Department of Education.

4 Oakes, J., et al. (1992), *Educational Matchmaking: Academic and Vocational Tracking in Comprehensive High Schools*. Santa Monica, CA: The RAND Corporation.

5 William T. Grant Foundation Commission on Work, Family, and Citizenship (1988), *The Forgotten Half: Non-College Youth in American*, Washington, DC: Author.

6 Muraskin, L.D. (Ed.) (1993), *Secondary Vocational Education: Availability, Coursetaking, and Outcomes*, Washington, DC: U.S. Department of Education, Office of Policy and Planning; Hayward & Wirt, op. cit.

7 Some of the districts that were located in rural areas at the time of this construction may have since become suburban.

8 Special population students are defined here based on three categories available in the Omnibus Surveys: disabled students, limited English proficient students, and economically disadvantaged students (defined by eligibility for the federal free and reduced price lunch program).

9 Because the special population groups may overlap, the figures in the text over-estimate the percentage of students with special needs, but accurately estimate the extent of need-based conditions that exist within a school or district.

10 The General Accounting Office also found that disabled and disadvantaged students are over-represented in vocational schools, and LEP students are under-represented (GAO, 1993, *Vocational Education: Status in School Year 1990–91 and Early Signs of Change at Secondary Level*. (GAO/HRD-93-71), Washington, DC: Author.)

11 Milne, A., Martindale, M., & Michie, J. (1993, September), *Vocational Education in Communitiess*, Draft report prepared for the National Assessment of Vocational Education. Rockville, MD: Westat, p. 13.

12 Friedenberg, J.E. (1993), *Participation by Limited English Proficient Adults and Out-of-School Youth in Vocational/Technology Education: A Review of Related Literature*, Draft report prepared for National Assessment of Vocational Education. San Marcos, CA: California State University, San Marcos.

13 Milne, et al., op. cit., p. 17.

[14] National Center for Education Statistics (1992). *Digest of Education Statistics,* Washington, DC: U.S. Department of Education.

[15] Milne, et al., op. cit., p. 28.

[16] Ibid.

[17] Ibid., p. 8.

[18] Our analyses, like those of the previous National Assessment, include only high school graduates; analyses that include non-graduates will yield slightly different estimates than those reported here.

[19] A better measure would have been student test scores on the NAEP assessments, but sampling and other technical problems precluded the linking of assessment and transcript data.

[20] In our Final Report we will examine transcript data from the 1992 National Educational Longitudinal Study (NELS), which provides a better LEP sample and a means to classify students as economically disadvantaged.

[21] Muraskin, op. cit.

[22] Science survey courses include a range of introductory as well as advanced courses.

[23] U.S. Bureau of the Census (1992), *Statistical Abstracts of the United States, 1992*, Washington, DC: U.S. Department of Commerce.

[24] Sections 201 and 235.

[25] Hoachlander, E.G., et al. (1992), *Vocational Education in the United States, 1969–1990*, Washington, DC: U.S. Department of Education, National Center for Education Statistics.

[26] Wagner, M. (1991). *The Benefits of Secondary Vocational Education for Young People With Disabilities:* Findings from the National Logitudinal Transition Study of Special Population Students. Menlo Park, CA: SRI International.

[27] General Accounting Office, op. cit.

[28] Milne, et al., op. cit.

[29] General Accounting Office, op. cit.

[30] Hayward & Wirt, op. cit.

[31] Ibid.

[32] Milne, et al., op. cit., p. 32.

[33] Due to small sample sizes, only the shift in business is statistically significant. However, we believe the consistent trend and size of the shift for agriculture and technical/communications warrant considering these shifts as "practically" significant.

[34] Muraskin, op. cit.

[35] Milne, et al., op. cit.

CHAPTER 5

PARTICIPATION IN POSTSECONDARY VOCATIONAL EDUCATION

INTRODUCTION

The Perkins Act, as previously mentioned, calls on the National Assessment to examine "participation in vocational education programs, including in particular, access of individuals who are members of special populations to high-quality vocational education programs."[1] This chapter examines these issues at the postsecondary level.

The postsecondary education system differs from the secondary system in a number of ways, including one that is crucial for this analysis — the postsecondary system is voluntary, entailing financial costs, rather than compulsory and free. This makes access issues at the postsecondary level somewhat different than at the (public) secondary level, where cost is not a factor. Also, one important issue at the secondary level, the effect of student placement or "tracking," is not as relevant in postsecondary institutions, and is not discussed here.

However, we are still concerned with who chooses to enroll in vocational education, the health of the system as indicated by enrollment trends, and the nature of movements in and out of postsecondary vocational education. At this level, the issue of student persistence and degree attainment is also critical, as the value of postsecondary education is greatest for those who complete a degree or certificate program. These issues are explored in this chapter.

The chapter begins with an examination of changes in access to postsecondary education over time, then maps the major providers of postsecondary vocational education, the vocational fields that are studied, and changes in these over time. We find that in spite of constant high school graduation rates and rising tuitions, participation in postsecondary education has increased, most likely in response to changing economic conditions.

We also find that vocational enrollments have remained a constant one-third of all postsecondary enrollments. Although the largest vocational programs at this level are in business, health, and technical fields, business enrollments are declining and health enrollments are increasing, clearly reflecting labor market trends. We also find that while most vocational enrollees are in public two-year institutions, the fastest growth has been among proprietary and four-year institutions.

We then turn to an analysis of who participates in postsecondary vocational education, focusing on special population students.[2] As at the secondary level, disabled and disadvantaged students are found to be over-represented in vocational programs, although at this level there is no strong evidence of recent increases in these enrollments. (Very limited data exist on limited-English-proficient student enrollments in postsecondary vocational education.) The chapter concludes by noting that students complete vocational programs at low rates, but at rates equivalent to or only slightly lower than those for academic programs. Indications of declining completion rates, and lower rates for secondary vocational students suggest potential problems.

The main source of data for this chapter is an analysis of student characteristics and program-area enrollments derived from the 1986 and 1989 National Postsecondary Student Aid Studies (NPSAS). Additional sources include tabulated enrollment data from the U.S. Bureau of the Census and U.S. Department of Education[3]; the National Assessment's Omnibus Surveys; and U.S. Department of Education student surveys.

Factors Affecting Postsecondary Enrollments

Because postsecondary vocational education is voluntary, enrollments at this level are subject to a number of economic and other conditions that have little or no effect on secondary-level enrollments. Five factors that are particularly important are prior educational preparation; enrollment costs (affordability); locale; the state of the economy; and the economic returns to postsecondary education.

Prior preparation, affordability, and locale determine enrollment levels in obvious ways, by making postsecondary programs more or less accessible. We discuss trends in these conditions below. Here we discuss the more general factors related to economic conditions.

The economic returns to postsecondary education refer to the long-term net payoff from enrolling in postsecondary education. This payoff includes the increase in lifetime earnings gained from postsecondary education, minus total attendance costs (including any wages foregone while attending school). Earnings gains accrue to those obtaining both associate and bachelor degrees, although they are higher for the latter. For example, for graduates of the class of 1972, the expected annual increase in salary for those with vocational associate degrees was $2,431, while for those with bachelor degrees it was $5,850.[4] In theory, as these earnings differentials increase, more people are attracted to postsecondary education, increasing enrollments .

The rate of return for a four-year college education has been increasing since the early 1980s, as the earnings gained from a bachelor degree have outstripped rising attendance costs; it now "pays" more to obtain a four-year degree. Few comparable data are available on changes in the return rate for sub-baccalaureate vocational degrees. The data that are available suggest that these rates are more variable, but increased in the 1980s.[5]

Postsecondary vocational enrollments are also widely believed to be inversely related to the strength of the economy. When the economy is strong, there is less to be gained by obtaining a postsecondary education, whereas in a poor economy, job competition is keener, leading more people to seek the skill advantage offered by postsecondary vocational education. Postsecondary vocational programs also often serve the retraining needs of displaced workers during an economic recession, further increasing these enrollments.

The recent recession combined with increasing rates of return for postsecondary education appear to be motivating recent increases in less-than-four-year postsecondary enrollments. As we will see below, these factors seem to outweigh others that have reduced the accessibility of postsecondary education.

ACCESS TO POSTSECONDARY EDUCATION

Preparation and Affordability

Access to postsecondary vocational education is determined by the accessibility of the various institutions that provide this type of education.[6] As we will see, this occurs primarily in public two-year institutions (mainly community colleges). These institutions expanded greatly during the 1960s and early 1970s, due to federal and state efforts to maximize student access to higher education. To this end, their entrance requirements are usually minimal, tuition costs are low, and provision of room and board is usually unnecessary. In addition, flexible scheduling and convenient locations allow students to work while attending school.

The other major providers of postsecondary vocational education are one- and two-year private and proprietary institutions; they also typically have minimal entrance requirements, but their costs are high. However, they often offer short programs (of one year or less), which make them appealing to individuals in search of training that will get them into the job market quickly.

Under these circumstances, access to postsecondary education is determined by two main factors — basic preparation and affordability. Basic preparation can be defined as the completion of a high school program.[7] Affordability is determined by three financial considerations — income level, tuition costs, and the availability of financial aid. Thus, only those individuals who can meet institutions' entry requirements and can afford tuition costs — because either the costs are an affordable proportion of income or they are covered by financial aid — have "access" to the postsecondary system.

The first determinant of access, student preparation, has not changed much in the past two decades. High school completion rates have remained relatively constant; they were 82 percent in 1973 and 83 percent in 1990. However, this stability exists because the rate for white students, by far the largest group of students, has remained unchanged. Completion rates have increased for blacks (from 68% to 78%) and, to a lesser extent, for Hispanics (from 55% to 60%).[8] So by this indicator, access to postsecondary education has increased significantly for blacks and slightly for Hispanics, although whites still have the greatest access.

Although preparation as measured by graduation rates has remained constant on average, increasing numbers of students need remedial education before enrolling in regular postsecondary-level courses. In the Omnibus community case study sites, researchers found that "students are arriving at the community colleges with increasingly lower achievement levels in basic skills."[9]

Part of this greater need for remedial education may be due to expanded assessment programs and improved identification of student deficiencies. However, another likely cause is the increasing proportion of high school graduates who enroll in postsecondary education, requiring these institutions to serve more lower-achieving high school graduates. As a result, the availability of remedial programs becomes crucial to ensuring that all high school completers have equal access to postsecondary education.

The vast majority of public two-year postsecondary institutions (95%) do offer remedial programs, and these programs are expanding. However, whether they offer sufficient remedial programs to meet all students' needs is unknown. The case studies noted that some state policies (e.g., prohibiting remediation in four-year institutions, increasing academic requirements for postsecondary vocational students) have placed an additional burden on the less-than-four-year sector, further increasing remedial enrollments and the demand for these courses.[10]

Finally, the door to postsecondary education is not fully open unless the potential student can — literally — afford to take advantage of this opportunity. In the 1960s and 1970s, affordability improved as tuition costs rose more slowly than family income, and financial aid programs grew.[11] Since 1980, however, college costs have risen sharply, faster than inflation, family income, and financial aid.[12] In addition, shifts in financial aid from grants to loans have further increased the financial burden of college attendance.[13]

These rising costs have hit lower-income families particularly hard. For example, public institutions' tuition, room, and board costs rose from 10 percent of median family income (the income of those earning less than 50% of all families) in 1979 to 13 percent in 1990. But for families at the 25th-income percentile (those earning less than 75% of all families), costs increased from 16 percent to 23 percent of family income. By 1990, private institution costs accounted for fully 62 percent of the income of families at the 25th-income percentile, up from 37 percent in 1979.[14]

Although tuition has increased at all types of institutions, the increase has been more dramatic for four-year than for two-year institutions. From 1980 to 1990, four-year tuition costs increased 37 percent (in real dollars) while two-year costs increased only 11 percent.[15] As a result, four-year tuitions grew from being 57 percent higher than two-year tuitions in 1980 to 93 percent higher in 1990. (These data do not include four-year institutions other than universities, but the trend is similar for universities.) The smallest cost increases have been for **public** two-year institutions.[16] Thus they have become **relatively** more accessible than other types of postsecondary institutions.[17]

In sum, based on affordability, access to both two-year and four-year postsecondary education is becoming more limited, after a period of becoming less limited. However, the costs of public two-year institutions have increased at a slower rate than those of four-year and private institutions. Finally, although the preparation of black and Hispanic students for entering postsecondary education has increased, higher attendance costs are likely to affect these students more than white students, as blacks and Hispanics tend to come from lower-income families. As we will see below, however, postsecondary enrollments continue to increase in spite of these constraints on access.

Access of Limited English Proficient Students to Postsecondary Vocational Education[18]

For students with special needs, access is also determined by the extent to which institutions provide the supplemental services these students need to enroll in and fully benefit from program offerings. We will discuss the nature and extent of available supplemental services further in Chapter 6. Here, we focus on one special population group — limited English-proficient (LEP) students — who face unique barriers to postsecondary vocational education.

Students who cannot speak or read English have historically been excluded from postsecondary education. In 1974, the U.S. Supreme Court ruled in Lau vs. Nichols that denying or delaying entry to an educational program because of a lack of English proficiency constituted discrimination on the basis of national origin, and is thus a violation of civil rights. As a result, the availability of vocational instruction in a language (or other form) that LEP students can understand is critical not only to meet the equal access assurances of the Perkins Act, but also to meet federal civil rights law.

Meeting the letter of this law can be costly and difficult, as appropriate staff for bilingual vocational courses are often in short supply.[19] Partly as a result of this difficulty, many postsecondary institutions screen students using English-language tests, then enroll those who are not English-proficient in English-as-a-second-language (ESL) classes prior to enrollment in other programs, including vocational education. In addition, at least in the 1980s, the language needs of LEP students enrolled in postsecondary vocational programs (including those funded under the 1984 Perkins Act) often were not adequately met.

Advocates for LEP students point out that these delays and inadequacies are illegal. While this is true, resource limits — particularly shortages of appropriately trained personnel — may be the main cause of these problems, rather than intentional discrimination. The community case study researchers, for example, concluded that institutions appear to be providing as much assistance to special needs students as possible, given the available resources.[20] Providing pre-vocational ESL classes may be the most efficient way for many institutions to guarantee **any** access to these programs for LEP students, at least until these resource limitations can be overcome.

The current extent of "delay of access" and inadequate provision of services, particularly in programs funded under the 1990 Perkins Act, is unclear. What is clear is that demand for these services continues to rise at both the secondary and postsecondary levels. For example, the number of 5- to 17-year-old children who do not speak English at home increased 38 percent from 1980 to 1990,[21] and immigrants are flocking to community colleges in record numbers.[22]

Thus, without greater effort and attention to LEP students, delays in access to vocational programs are sure to become longer and more common. Perkins funds can help in this regard, and seem to be doing so in some cases. As we will see in Chapter 6, Perkins-funded secondary school districts appear to be increasing supplemental services for LEP students to a greater extent than are unfunded districts, suggesting that funded districts are focusing on this problem. But Perkins-funded postsecondary institutions are not increasing LEP student services any more than those that are unfunded. It appears that funded institutions are not moving any more quickly than others to reach full compliance with civil rights requirements and the Perkins equal access assurances for LEP students.

MAP OF THE POSTSECONDARY VOCATIONAL EDUCATION SYSTEM

Before looking at vocational enrollments, it is useful to review the scope and nature of the postsecondary delivery system. For this report, we divide the major postsecondary providers into six groups: public two-year to three-year institutions (primarily community colleges, termed public two-year); public less-than-two-year (vocational-technical institutes); for-profit less-than-four-year (proprietary); private two- to three-year (private two-year); and public and private four-year.

Just over half of all postsecondary students are enrolled in less-than-four-year institutions, with the largest group enrolling in public two-year institutions (see Figure 5.1 and Appendix Tables A-5.1 and A-5.2).[23] Vocational training predominates among the less-than-four-year institutions, accounting for 67 percent of their enrollments, compared to less than 5 percent of four-year institution enrollments (based on 1989 NPSAS data).

Postsecondary vocational education thus is concentrated in less-than-four-year institutions, which enroll 95 percent of all postsecondary vocational students (see Figure 5.1). Public two-year institutions enroll the greatest percentage of vocational students, 66 percent, while proprietary institutions enroll 22 percent and the remaining institutions enroll only 12 percent.

VOCATIONAL ENROLLMENTS

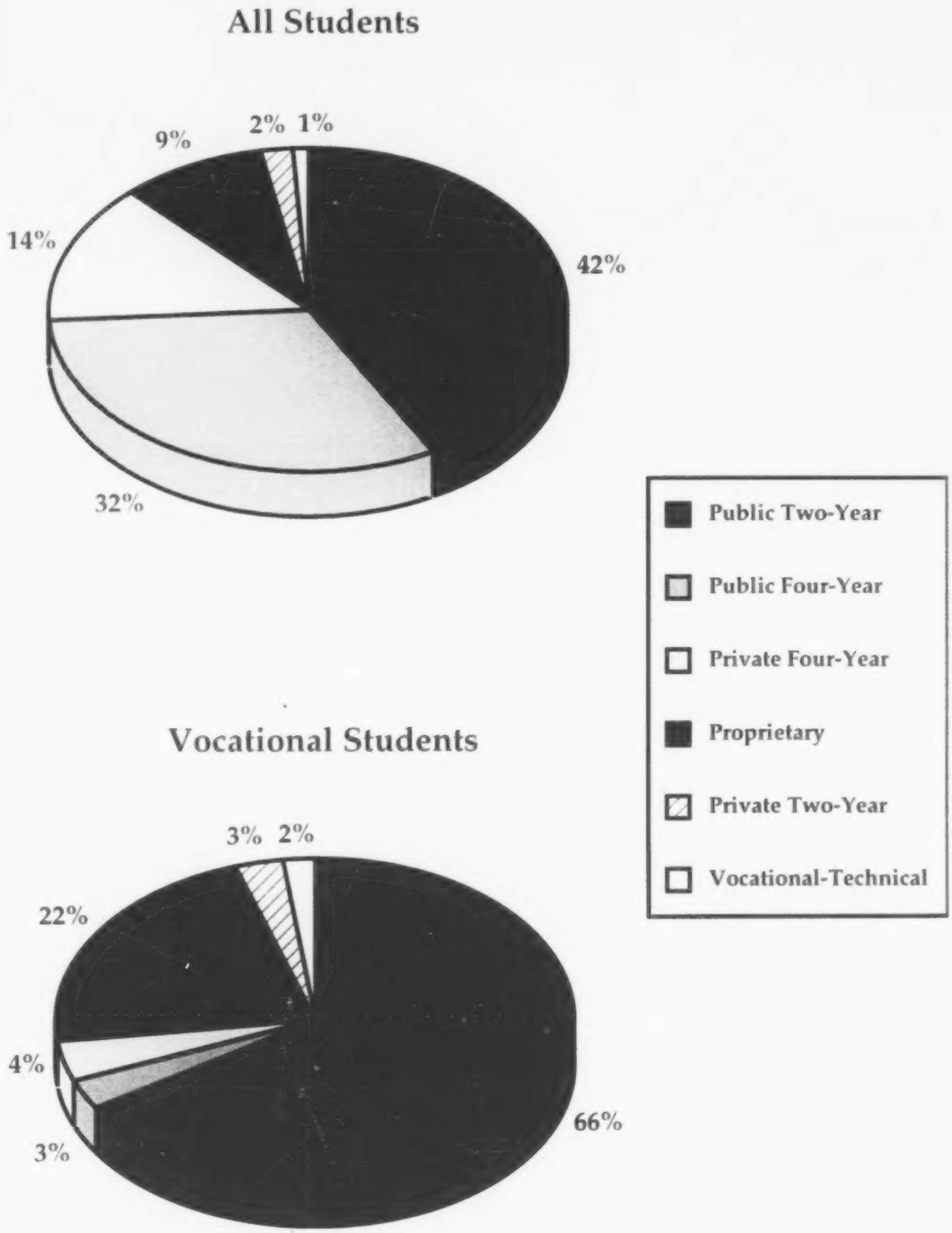
Vocational students make up a significant share of all postsecondary enrollments. In 1989, 35 percent of all postsecondary students were enrolled in vocational programs. The remainder were enrolled in bachelor's degree programs (BA programs, 45%) or in academic programs that do not lead to a bachelor's degree (academic non-BA programs, 19%).[24]

From Fall 1986 to Fall 1989, all three types of postsecondary enrollments increased, in spite of a declining college-aged population and increasing attendance costs. Higher college attendance rates for recent high school graduates accounted for part of this growth (they rose from 54% to 60% over this period). As mentioned above, the recession, combined with increases in the economic return to postsecondary education may have contributed to an increased interest in postsecondary education among both recent graduates and older individuals.

Enrollment increases in the vocational and academic sectors were essentially equivalent: Both increased by just under 15 percent, and the proportion of postsecondary students enrolled in vocational programs did not change.[25] However, the distribution of vocational students among postsecondary institutions did change. The proportion of vocational students enrolled in four-year and proprietary institutions increased from 1986 to 1989, while the proportion enrolled in two-year public institutions declined (see Table 5.1).

The growth in vocational programs at four-year institutions may reflect their attempts to increase enrollments in the late 1980s, as the college-aged cohort declined.[26] The growth in proprietary schools reflects a combination of factors: the demand for short-term programs, increased access to federal funding, and aggressive marketing by proprietary schools. This enrollment growth may be problematic, however, as proprietary student default rates tend to be high, implying that the economic gains from these institutions often do not outweigh their costs.[27] This insufficient economic return is all the more troubling because

Figure 5.1
Proportion of Students Enrolled in Each Type of Postsecondary Institution, 1989–90



All Students

Vocational Students

Source: Tuma (1993)

Table 5.1
Changes in Vocational Enrollments from Fall 1986 to Fall 1989 by Institution Type

Institution Type	Vocational Enrollments			Percent of All Vocational Enrollments	
	1986	1989	Percent Change	1986	1989
Private four-year	60,685	94,769	56	2	3
Public four-year	86,897	172,541	99	3	5
Private two-year	99,079	97,164	-2	3	3
Public two-year	2,086,155	2,213,243	6	68	64
Public voc-tech	129,746	128,520	-1	4	4
Proprietary	601,753	767,340	28	20	22

NOTE: The 1989 enrollment data discussed earlier were for the full year, but this table presents Fall enrollments only, to provide data comparable with the 1986 NPSAS, which includes only Fall data. Fall enrollments underestimate the total in the less-than-four year institutions, which typically have open enrollments during the school year. Assuming the enrollment rate during the school year did not change from 1986 to 1989, the relative change between years should be accurate.

Source: National Postsecondary Student Aid Studies, Fall 1986 and Fall 1989

these institutions serve disproportionately high percentages of minority and low-income students (see later sections) — those students most in need of improved opportunities for economic success.

Enrollments also shifted slightly within public two-year institutions from vocational to academic non-BA programs, as more "academic" students opted for two-year institutions — perhaps because of increased costs and entry requirements at four-year institutions. Both of these factors were evident in a number of community case study sites. At one site, for example, it was reported that "nonvocational enrollment has grown because increasing numbers of students are completing the first two years of a baccalaureate program while paying lower tuition costs at [the community college]." Another site reported that "more [community college] students are enrolling in the academic courses that are necessary to meet university requirements."

Thus, postsecondary vocational enrollments continue to grow in most institutions. Although non-BA academic enrollments have been growing faster than vocational enrollments at public two-year institutions, these increases have come at the expense of the BA sector, not the vocational sector. Unlike — and in spite of — declining vocational enrollments at the secondary level, vocational enrollments at the postsecondary level appear to be keeping pace with overall enrollment increases.

VOCATIONAL ENROLLMENTS BY PROGRAM AREA

In 1989, almost three-quarters of all postsecondary vocational students were enrolled in just three program areas: business (29%), health (22%), and technical (23%). An additional 15 percent were in the traditional trades, leaving only 11 percent of all postsecondary vocational enrollments in agriculture (1%), marketing (2%), occupational home economics (4%), and "undefined" areas (5%) (most likely students who are undecided).[28]

Compared to secondary enrollments, these data show higher enrollments in health and technical fields, and lower enrollments in the trades. Interestingly, however, secondary programs are changing in ways that make them more closely resemble their postsecondary counterparts. Health and technical programs are expanding at the secondary level (according to administrator reports and enrollment data), while secondary trades programs are declining. This seems to imply an increasing articulation between secondary and postsecondary programs.

Postsecondary enrollment changes largely parallel employment projections. From 1986 to 1989, enrollments remained constant in most vocational fields, but decreased in business (39% to 28%) and increased in health (16% to 23%) and occupational home economics (2% to 5%).[29] This matches U.S. Census data which show that for 1990–2005, typists and word processors are among the fastest declining jobs, while nurses, medical assistants, home health aides, child care workers, and food preparation workers are among the fastest growing or those with the largest job growth.[30]

CHARACTERISTICS OF VOCATIONAL STUDENTS

We know that postsecondary vocational enrollments have been increasing at the same pace as all postsecondary enrollments. But what are the characteristics of these vocational education enrollees, and have they changed over time? For example, we saw (in Chapter 4) that disabled and disadvantaged students are increasingly over-represented in secondary vocational education. In this section, we examine whether similar patterns are evident at the postsecondary level.

Because postsecondary education is voluntary, additional characteristics, such as enrollment status (full- vs. part-time) and student age, are also relevant. We begin with these.

Enrollment Status and Age

Many postsecondary students, particularly those who are not in BA programs, are older, part-time students. Vocational students are evenly split between those who enroll part-time (51%) and those who enroll full-time (49%), while 65 percent of academic non-BA students enroll part-time. This is in sharp contrast to bachelor degree students, only 25 percent of whom are enrolled part-time.

These enrollment patterns are clearly related to the life-stage at which students enroll in these programs. Older students are more likely to enroll part-time (since they are more likely to be employed), and vocational and academic non-BA students are notably older than bachelor degree students. For example, while one-third of vocational and academic non-BA students are 30 or older, only 14 percent of BA students are this old (see Appendix Table A-5.3). This age distribution reflects the greater focus of less-than-four-year institutions and programs on adult continuing education. Many community colleges, for example, market their programs to working (or unemployed) adults who need job retraining or skill upgrading.

Over time, students' enrollment status has remained fairly stable, in spite of an aging of the postsecondary population. While the age distribution of vocational students did not change between 1986 and 1989, longer trend data show that the two-year student population has become older. The percentage of 16–19 year-olds enrolled in these institutions declined from 1980 to 1990 (from 35% to 27%), while the percentage of students over 30 years old increased (from 24% to 30%).[31] This trend seems to result more from the aging of the population than from increasing proportions of older students attending these institutions.[32] Given this cause, it is likely that both vocational and academic students have become older on average.

Sex Distribution of Vocational Students

One of the clearest and strongest trends in postsecondary education in the past two decades is the increased participation by women. In 1970, women attended college in lower numbers and at a lower rate than men, and earned fewer associate and bachelor degrees. By 1990 all these patterns had reversed.[33] For example, in 1989–90, more postsecondary students were female than male, including students in vocational programs (54% female), academic non-BA programs (61%), and BA programs (53%).[34]

The increase in female postsecondary enrollments seems to be attributable both to larger numbers of women completing high school,[35] and especially to larger numbers going on to college. For example, from 1970 to 1991, the college enrollment rate for women rose from 49 percent to 67 percent, while for men it increased only from 55 percent to 58 percent.[36] The increase for women can be attributed both to increased educational aspirations and to greater financial needs among women (due to single adulthood, single parenthood, or the need for a second family income).

The increase in women's participation in both four-year and two-year postsecondary institutions[37] suggests that female enrollments in vocational programs have increased as well. There are no long-term trend data on this; however, data on the receipt of less-than-four-year awards and associate degrees in vocational fields show that women received 53 percent of these credentials in 1983, and 55 percent in 1989.[38]

In short, women's college entry rates and enrollments have increased faster than those of men, and seem to be continuing to do so (although at a slower pace). The extent to which these overall trends apply to vocational education is unclear, but data on degree awards suggest that women may be slowly increasing their participation in this area as well. Nonetheless, as we will see in a later section, there is one area of continuing equity concern: Female participation in vocational programs nontraditional for their gender appears to have stalled. Female students are attending postsecondary institutions in record numbers, but they are still enrolled in traditionally female fields of study.

Racial/Ethnic Distribution of Vocational Students

Postsecondary enrollments in general, in less-than-four-year institutions, and in vocational education vary by students' race/ethnicity. Racial and ethnic minorities as a whole are enrolled in postsecondary education in proportion to their representation in the population. However, this overall equitable picture masks the fact that Asians are slightly over-represented while blacks and Hispanics are slightly under-represented (see Table 5.2).

Among those enrolled in postsecondary institutions, non-Asian minorities are more likely than white and Asian students to enroll in the less-than-four-year-sector. While 51 percent of white students and 54 percent of Asian students are enrolled in less-than-four year institutions, 63 percent of black and Hispanic enrollments are in these institutions, as are 67 percent of Native American enrollments.[39] These patterns most likely reflect differences in the degree to which these students can afford to attend different institutions, and in their level of preparation for postsecondary education.

Non-Asian minorities are also over-represented in postsecondary vocational education (see Table 5.2); these students make up 19 percent of all postsecondary students, but 25 percent of vocational students. Blacks are particularly likely to be over-represented in vocational education, a fact that is not just due to their

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Table 5.2
Percent of U.S. Population and of Total and Vocational Postsecondary Students by Race/Ethnicity, 1989

Race/Ethnicity	U.S. Population	Postsecondary Students	Vocational Students
White	76	76	71
Black	12	10	14
Hispanic	9	8	10
Asian	3	5	4
Native American	1	1	1

Source: Tuma (1993)

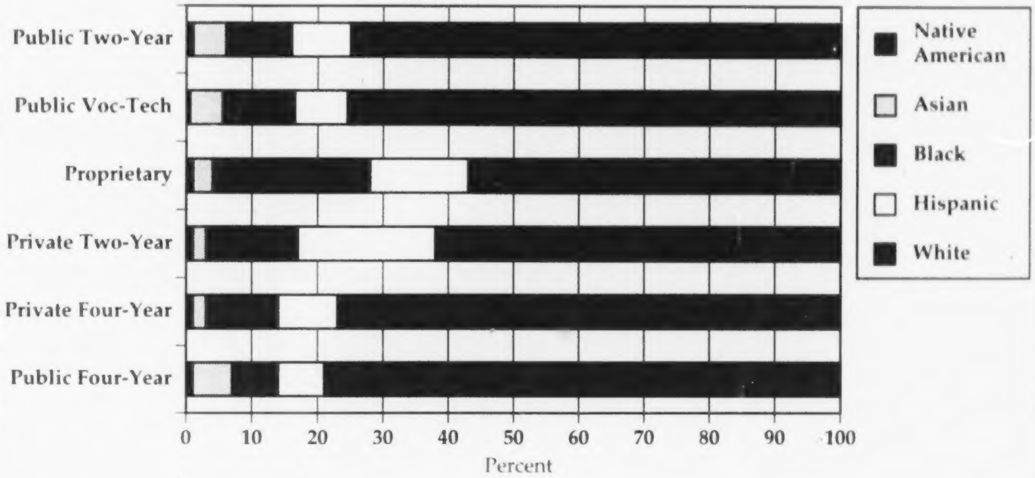
lower socioeconomic status. Independently of SES, blacks are more likely than individuals of other racial/ethnic groups to enroll in vocational programs rather than other types of postsecondary programs.[40]

This mirrors the enrollment pattern at the secondary level, where black secondary students earn more vocational education credits than other students, and Asian students earn fewer. For Asian students, these results seem to reflect their greater orientation toward four-year colleges. It is less clear what motivates the vocational enrollment pattern of black students.

Students of different racial/ethnic backgrounds also tend to enroll in vocational programs at different types of institutions. White and Asian students are more likely to enroll in public institutions, while blacks are more likely to enroll in proprietary institutions and Hispanics in private junior colleges (see Figure 5.2). Possible reasons for these enrollment patterns include institutions' recruitment strategies, entry requirements, and the existence of private Hispanic colleges. Another likely reason is the location of the different institutions, as private and proprietary schools are more often located in urban areas, and public institutions in suburban and rural areas.[41] Ironically, the result of this distribution is that the student racial/ethnic groups that are most likely to be low-income are also those most likely to attend costlier institutions, a factor undoubtedly related to their use of Pell Grants.

From 1986 to 1989 no marked changes occurred in the enrollments of minority or white students in vocational education. Again, longer term trend data do not provide information on vocational enrollments specifically, but do provide a

Figure 5.2
Vocational Students of Each Race/Ethnic Group Enrolled in Postsecondary Institutions, by Institution Type, 1989



Source: Tuma (1993)

broader context for examining changes in postsecondary enrollments. In the past two decades, both two-year and four-year postsecondary enrollments have become slightly more racially diverse. Minority enrollments at two-year institutions increased from 20 percent in 1976 to 23 percent in 1990; at four-year institutions, they increased from 13 percent to 17 percent.[42]

This increase seems to result primarily from an increase in the proportion of postsecondary students that are Hispanic and Asian.[43] For Asian students, this enrollment growth is attributable to both increasing population size **and** increasing enrollment rates. For Hispanics the growth is attributable mainly to a growth in population size, as their enrollment rates have remained stable. Enrollments have increased less than population size for blacks and Native Americans, implying that their enrollment rates have declined (See Appendix Table A-5.4).[44]

Special Population Students in Vocational Education

The Perkins Act seeks to ensure that special population students have equal access to quality vocational programs at both secondary and postsecondary levels. Enrollments of these students are thus of particular interest. As defined in the 1990 Perkins Act, special population students include those who are educationally disadvantaged, economically disadvantaged, disabled, limited-English-proficient, or enrolled in programs designed to eliminate sex bias in vocational education.

Data on the postsecondary participation of each of these groups are very limited. Here, we review the information that is available from the NPSAS and Omnibus Surveys. Using NPSAS data, we constructed categories of students for each of these special population groups and for single parents, another group targeted by the Perkins Act.

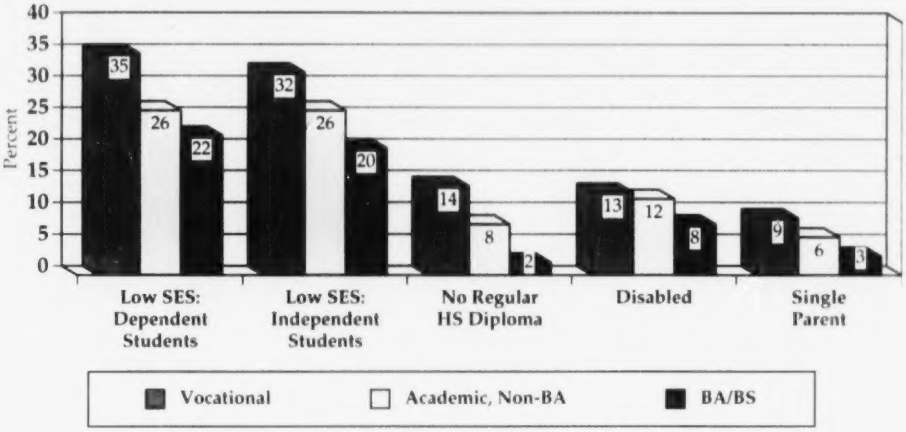
NPSAS Definitions. The NPSAS does not allow for an identification of LEP students, but does provide means for identifying students who are economically disadvantaged, educationally disadvantaged, disabled, or single parents. Economically disadvantaged students are defined as those in the lower quarter of constructed socioeconomic status (SES) measures based on parents' education and occupation; educationally disadvantaged students are those who did not earn a regular high school diploma; disabled students are self-defined as such;[45] and single parents are self-defined as unmarried students with dependents. The single-parent category can include students taking care of infirm adult relatives as well as those caring for children, but it seems reasonable to expect that the vast majority of these individuals have dependent children, and are thus single parents.

Special Population Enrollments. Vocational programs enroll a higher proportion of each of these special population groups than do other postsecondary programs. Academic non-BA programs enroll the next highest proportions, and bachelor degree programs enroll the fewest (see Figure 5.3). This mirrors the pattern at the secondary level, where disabled and educationally disadvantaged students participate in vocational education at higher rates than other students (see Chapter 4).

These enrollment differences exist primarily across, not within, institutions. The exclusively vocational institutions (vocational-technical institutes and proprietary schools) tend to enroll the highest proportions of special needs students, while the four-year institutions, with a predominantly academic focus, tend to enroll the smallest proportion. The more "mixed" vocational-academic institutions (public and private two-year) fall in between. (see Table 5.3.)

Within each type of institution, vocational, academic non-BA, and BA students are about equally likely to be economically disadvantaged, educationally disadvantaged, disabled, or single parents.[46] Thus, the differences among vocational and other students arise because "vocational" schools serve relatively high proportions of special population students, while "academic" institutions serve low proportions and "mixed" institutions are mid-level — regardless of the students' educational program. This suggests differential levels of access among these institutions, with exclusively vocational institutions providing the most

Figure 5.3
Postsecondary Students in Each Special Population Category By Program Type, 1989



Source: Tuma (1993)

Table 5.3
Percentage of Vocational Students in Each Special Population Category, by Institution Type, 1989

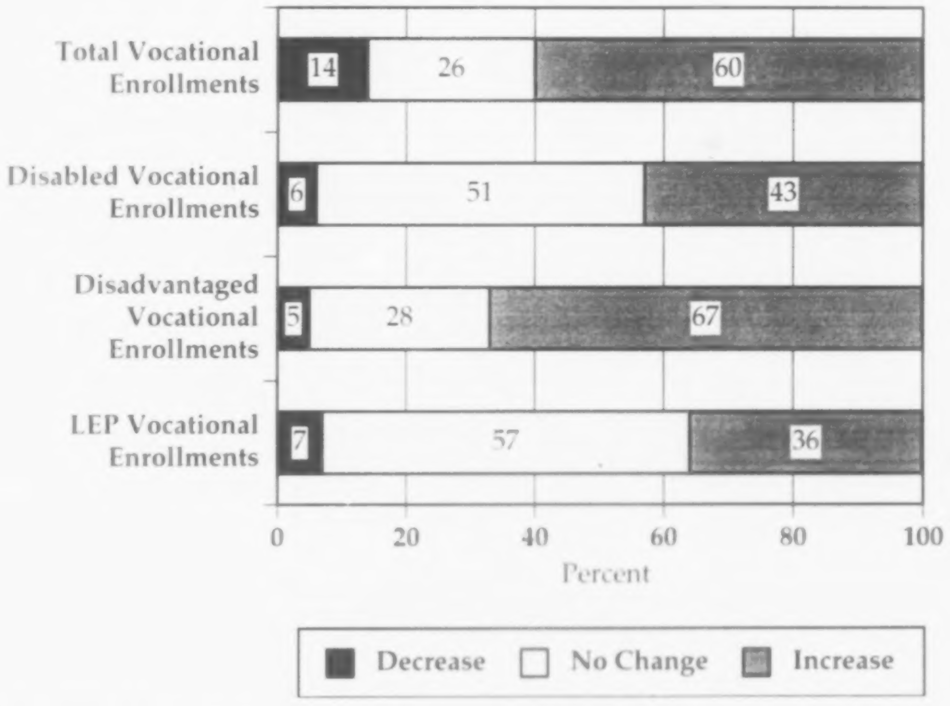
	Lower Quarter of SES				
Institution Type	Dependent Students	Independent Students	No Regular High School Diploma	Disabled	Single Parent
Public two-year	28	30	10	12	8
Public voc-tech	48	47	24	17	8
Proprietary	57	38	27	16	13
Private two-year	36	30	18	10	8
Private four-year	26	27	4	8	5
Public four-year	22	27	4	7	5

Source: Tuma, 1993

access for (vocational) special population students, and four-year colleges the least.

From 1986 to 1989, few changes occurred in special population enrollments, but as we have seen, this time span is often too short to reveal longer-term trends. In the Omnibus Surveys, we asked postsecondary vocational directors about changes in vocational enrollments between 1987 and 1992. These data show that the enrollments of disabled, disadvantaged, and LEP students in vocational education increased on average, but only the enrollment of disadvantaged students increased more often than overall vocational enrollments. The enrollment of disabled and LEP students increased less often than the overall totals (see Figure 5.4), suggesting that the **proportion** of vocational students who are disabled or LEP may be decreasing while the proportion who are disadvantaged may be increasing.

Figure 5.4
Changes in Vocational Enrollments at Two-Year Public Postsecondary Institutions from 1987–88 to 1991–92



Source: Omnibus Postsecondary Institution Survey

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With no corroborating evidence, these administrator reports should be viewed as tentative evidence of enrollment changes. Even if they are accurate, the increase in disadvantaged vocational students may reflect **overall** postsecondary increases in students with educational or economic disadvantages. Longer term trend data on actual enrollments are needed before firm conclusions can be drawn.

The limited evidence suggests that trends in the enrollment of postsecondary special population students in vocational education are different from those at the secondary level. In general, the increasing concentration of special needs students in vocational education found at the secondary level is not evident at the postsecondary level. While disadvantaged students may be increasing their participation in vocational education at both levels, at the secondary level this is clearly occurring independently of changes in the composition of the entire student body. At the postsecondary level, this may not be true. And while disabled students are increasing their enrollments in secondary vocational education, there is no evidence of a corresponding increase at the postsecondary level.

Special Population Enrollments by Vocational Program Area

At the secondary level, there are concerns about the channeling of special needs students into specific program areas, particularly home economics and the trades. These concerns are less relevant at the postsecondary level, where students make more independent choices. However, choices made at the secondary level can have carryover effects on these enrollments as well.

We saw in Chapter 4 that secondary-level occupational home economics and trades courses enroll disproportionately high shares of educationally disadvantaged and disabled students, while technical/communications programs enroll disproportionately few of these students. A somewhat different picture emerges at the postsecondary level (see Table 5.4). At this level, trades programs also enroll disproportionately high shares of these special needs students, but occupational home economics programs do not. Further, postsecondary agriculture programs enroll disproportionately low shares of these students, while technical programs do not. One reading of these data is that secondary programs may be overly encouraging special population enrollments in occupational home economics and overly discouraging these enrollments in technical courses.

Nontraditional Vocational Education Enrollments

As mentioned in Chapter 4, the Perkins Act encourages the enrollment of students in programs that are "nontraditional" for their gender (e.g., women in agriculture, men in nursing). Monitoring these enrollments allows us to determine the extent to which progress is being made in this area. In this section,

Table 5.4
Percent of Students Majoring in Each Vocational Program Area, 1989[a]

Program Area	Lower Quarter of SES		No Regular High School Diploma	Disabled
	Dependent Students	Independent Students		
All program areas	35	32	14	13
Agriculture	16	—	2	8
Business	32	32	14	10
Marketing	32	20	9	14
Health	34	32	15	9
Occupational Home Ec.	28	38	9	11
Technical	32	30	11	14
Trades	47	35	23	19

— Too few cases to provide estimate.

[a] Single parents are not included because their enrollments are confounded by the fact that most of these individuals are female.

Source: 1989 NPSAS

we examine nontraditional enrollments by determining the sex composition of students in different majors, and how these have changed over time.

While both academic and vocational program majors run the gamut from "predominantly female" to "predominantly male," more vocational than academic majors are highly sex-segregated. For example, in 1989, 10 of 21 vocational majors enrolled at least three-quarters of students of one sex, compared to only 4 of 19 academic majors. (Data on nontraditional enrollments are listed in Appendix Table A-5.5.)

The most "male" vocational majors are found in the traditional trades (engineering, transportation, precision production, mechanics, and construction), while among academic programs they include the physical sciences and philosophy. The most "female" majors include vocational majors in health, business support, consumer services and home economics, and academic majors in legal assistant, education, and public affairs.

For the most part, neither academic nor vocational majors were less sex segregated in 1989 than they were in 1986. In fact, where sex segregation in vocational majors does show signs of dissipating, it is in predominantly female fields that are now enrolling more male students; predominantly male fields are not increasing their enrollments of female students. For example, from 1986 to 1989 men increased their (proportional) enrollments in the predominantly female majors of business support, consumer services, allied health, and home economics. Of the predominantly male majors, two — mechanics and natural resources — show slight, but not statistically significant, increases in female enrollments.

Data from previous years show that this lack of change does not result from the short time span examined with the NPSAS data. Postsecondary vocational enrollments from the 1970s to 1980s followed a similar trend[47] — relatively more credits earned by men in predominantly male fields (engineering and science technologies; trade and industry; agriculture), as well as relatively more credits earned by men in predominantly female fields (home economics and health) (see Table 5.5). One predominantly male field, protective services, had an increase in the proportion of credits earned by women, although this occurred mainly because men earned fewer credits in this field, rather than women earning more.

In short, sex equity for women is not being achieved, or even approached, in postsecondary vocational education. Vocational majors are more sex-segregated than academic majors, and while men seem to be moving into some predominantly female vocational fields, women show little, if any, tendency to move into predominantly male fields.

This is a less encouraging pattern than at the secondary level, where some movement of female students into two of three predominantly male fields (agriculture and technical/communications) does seem to be occurring. It is unclear why this is not occurring at the postsecondary level. One possible explanation is that once female students leave high school and enter nontraditional occupations, they find that they are not as welcome or as comfortable in these fields as they had expected, and so switch to more traditional fields. Another possible explanation is that secondary students are simply younger and thus more accepting of nontraditional career choices.

COMPLETION AND DROPOUT RATES

Finally, as Chapter 15 shows, obtaining an educational credential (diploma, certificate, or degree) contributes to the employment success of vocational students, and thus can serve as one measure of the value or quality of the

Table 5.5
Ratio of Postsecondary Credits Earned by Males to Credits Earned by Females in Vocational Program Areas, for 1972 and 1980 High School Seniors [a]

Vocational Program	1972 Seniors	1980 Seniors
Engineering/science technology	17.0	27.0
Trade and industry	7.3	10.0
Agriculture	4.0	5.0
Protective services	4.0	1.7
Computers/data processing	1.3	1.7
Marketing	1.0	0.8
Business and office	0.6	0.6
Home economics	0.2	0.5
Health	0.1	0.3

[a] The Ratio provides the number of credits earned by males for every credit earned by females. Thus, a ratio of 1.0 signifies sex-balanced enrollments, a ratio greater than 1.0 signifies more credits earned by males than by females; and a ratio smaller than 1.0 signifies more credits earned by females than by males.

Source: Hoachlander et al. (1993)

education students receive. In this section, we examine the rate at which postsecondary students earn credentials.

Since the available data follow postsecondary students for a limited time (2–4 years), not all students can be definitively categorized as completers and non-completers. We divide them into three groups: completers (those who have earned a credential), persisters (those still in school), and dropouts (those who have left school). Eventually, some dropouts will return to school (i.e., they are "stop-outs"), while some persisters will either drop out or earn a credential. These facts should be kept in mind when interpreting the findings below.

Determining postsecondary completion rates is also complicated by the different goals of individuals who enroll in less-than-four-year institutions. Community colleges, the largest provider within this sector, tend to have broad missions, with a student body that is varied in its goals and motivations. As in other sectors, some students attend these institutions to obtain a credential, but others intend to transfer to a four-year institution, upgrade their job skills without a credential, or meet strictly personal goals. For these latter students, the receipt of a (less than baccalaureate) credential is an irrelevant indicator of "success."

No extant datasets accurately separate these different groups of students. Doing so is virtually impossible, as students are often unclear as to their intentions, exaggerate them, and/or change them over time. However, by considering only those students who seem most likely to be working toward a degree or certificate, we can obtain reasonably valid estimates of completion rates. The National Longitudinal Survey (NLS) and High School and Beyond (HSB) data are useful in this regard, since both are restricted to recent high school graduates, a group that is likely to have high rates of postsecondary completion intentions. (However, these data also exclude those older students who intend to earn a credential, and whose completion rates may be different from those of recent high school graduates.) The Beginning Postsecondary Study (BPS) is also useful. To capture those most likely to be planning to earn a credential on the BPS, we restricted the sample to full-time students.[48]

Completion, persistence, and dropout rates from the BPS are presented in Table 5.6. Since these BPS data are for full-time students at least two years after program entry, most students will have had an opportunity to earn a credential by the time the data were collected. In fact, other than those in two-year public institutions, 42–65 percent of students had earned a credential; most of the rest had dropped out. While completion rates of 42–65 percent may seem low, they are comparable to that for students at four-year institutions. About 40 percent of students entering a four-year college immediately after high school receive a bachelor degree four years later (based on analyses of the 1972 NLS).

At the public two-to-three year institutions (mostly community colleges), the long-term enrollment of transfer students most likely accounts for the higher persistence rate (33%) and lower completion rate (26%). However, dropout rates are as high at these institutions as at others. Since dropout rates tend to increase over time, longer term completion rates might be somewhat lower for these institutions than for others.

As mentioned above, over a longer time period some of the students who have left school will return and earn a credential, while some who are still in school will drop out. If we assume that these dropouts and the "return" group balance each other, then final completion rates for all less-than-four-year institutions should be between 48–67 percent, with most at about 60 percent.[49] This is slightly lower than that for four-year students; 65 percent of students who enter four-year colleges immediately after high school eventually obtain a bachelor degree.[50]

Data from the High School and Beyond yield comparable findings. A fairly consistent 42–46 percent of students at community colleges, public vocational

Table 5.6
Dropout, Persistence, and Completion Rates for Full-Time Students Entering Less-Than-Four-Year Postsecondary Institutions in 1989–90[a]

Institution Type	Dropout Rate	Persistence Rate	Completion Rate
Less-than-two-year			
Public	52	4	44
Private	41	7	52
Proprietary	33	2	65
Two or three year			
Public	40	33	26
Private	41	17	42
Proprietary	42	6	52

[a] Rates as of February 1992.

Source: 1992 Beginning Postsecondary Study

schools, and proprietary institutions left school within four years (see Table 5.7). If we again assume that late-completers will be balanced by dropouts, final completion rates should be between 54–58 percent, somewhat lower than the 65 percent for four-year students.

Finally, dropout rates at community colleges and public technical institutes increased from the 1970s to the 1980s, although they remained constant at proprietary institutions (see Table 5.7).[51]

Whether these higher dropout rates signify increased difficulty completing programs, increased numbers of students pursuing non-credential goals, or other factors is unclear. However, the increases were most pronounced among the most disadvantaged groups of students — those with low aspirations, low socioeconomic status, and low achievement levels. [52] This suggests that increased graduation requirements or other factors that differentially affect disadvantaged students may contribute to the increase in dropout rates.

Within community colleges, vocational and academic students are equally persistent, leaving school at approximately the same rate (42% in Goodwin, 1989; 44% and 39%, respectively, in Grubb, 1989). However, the previous National

Table 5.7
Completion, Persistence, and Dropout Rates for Classes of 1972 and 1980, Four Years After High School Graduation (Percent)

	Community College	Public Technical Institute	Proprietary School
Earned credential			
Class of 1972	23	32	38
Class of 1980	19	36	36
Transferred to other institutions			
Class of 1972	28	18	16
Class of 1980	25	9	13
Still enrolled			
Class of 1972	20	14	5
Class of 1980	14	9	9
Left with no credential			
Class of 1972	30	36	41
Class of 1980	42	46	42

Source: Goodwin (1989), and Grubb (1993)

Assessment found that dropout rates differ for community college students who were enrolled in different programs during high school. Students who were in a secondary vocational program were the most likely to drop out and the least likely to complete (see Table 5.8).

This pattern was not as clear, however, at public technical institutes or proprietary institutions, which tend to have shorter programs with less academic content. At these institutions, high school vocational students complete at higher rates than general track students, and at rates equal to those of academic students. These findings suggest that high school vocational students are relatively well prepared for short, occupationally focused postsecondary education, but are the least prepared of all high school students for longer term postsecondary education with an academic foundation.

In short, postsecondary vocational programs do not have high completion or persistence rates, although their rates are comparable to those for

Table 5.8
Completion, Persistence, and Dropout Rates for Class of 1980, by Type of Postsecondary Institution and High School Program (Percent)

High School Program	Completion Rate	Persistence Rate	Dropout Rate
Community College			
Academic	23	46	31
Vocational	13	33	54
General	20	37	44
Vocational Technical Institute			
Academic	41	15	44
Vocational	43	16	41
General	27	21	53
Proprietary Institution			
Academic	42	23	35
Vocational	38	17	44
General	31	27	42

Source: Goodwin (1989)

less-than-four-year academic programs, and almost as high as four-year academic programs. There is some evidence that completion rates at public less-than-four-year institutions may be declining. This trend may be unique to the less-than-four-year sector.[53]

In any case, low and declining completion rates are inconsistent with a labor market moving toward higher skills and more technical training. Further, these findings suggest a potential problem for tech-prep programs, which are specifically designed to provide two-year credentials for vocational students. If they are to succeed in this aim, tech-prep programs will have to find ways to ensure a higher rate of postsecondary completion, particularly for secondary vocational students.

CONCLUSION

Vocational education occupies a large, relatively stable niche within the postsecondary education system. Fully one-third of all postsecondary students are vocational, and two-thirds of students at less-than-four-year institutions are vocational. Vocational enrollments, like postsecondary enrollments in general, have been increasing, in spite of higher costs and a smaller cohort of college-aged students. It appears that people continue to be attracted to postsecondary education because of its ability to improve job opportunities and pay.

Vocational programs serve a wider array of students, particularly from special populations, than do other postsecondary programs, mainly by providing programs in more diverse and accessible institutions. Non-Asian minorities are over-represented in postsecondary vocational education, as are disabled and disadvantaged students. However, there is no evidence that special population students are increasing in postsecondary vocational education, as they are at the secondary level. Also, declines in vocational enrollments are not evident at the postsecondary level. At this level, vocational enrollments are increasing at about the same pace as enrollments in general.

Whatever factors are driving down secondary vocational enrollments (increased academic requirements, declining program budgets, faltering local economies) do not seem to be affecting postsecondary enrollments. The latter operate in an environment where the human capital model of economic costs and benefits seems to drive enrollment trends. For example, shifts in postsecondary vocational enrollments appear to largely follow labor market trends, with enrollments increasing in health and occupational home economics, matching job growth in the health, child-care, and food-service industries, and declining in business, matching the loss of typing and word processing jobs.

The demand for short-term education programs appears to be reflected in the continuing growth of proprietary school enrollments. The conflicting needs for more education and immediate income reflected in this preference are likely to continue. This dilemma provides one of the greatest challenges for postsecondary institutions, including tech-prep programs.

The need for immediate income is probably one reason why postsecondary students in general have rather low completion rates, in spite of the economic gains that can be garnered from program completion. Vocational students do not appear to leave or complete programs at rates very different from academic students, although limitations in these data make this conclusion somewhat speculative.

Students who were "vocational" in high school have lower completion rates than other students at community colleges, although their completion rates are comparable at more technical postsecondary institutions. This may reflect lower levels of academic preparation among secondary vocational students (as seen in Chapter 4). Another possibility is that secondary vocational students in community colleges have lower completion rates in academic programs but not in vocational programs. This would also be problematic, however, as it implies that secondary vocational students have more limited postsecondary options.

Finally, there is also tentative evidence that postsecondary students in less-than-four-year public institutions (which account for almost three-quarters of vocational enrollments) are increasingly leaving school without credentials. These data are for enrollments from the mid-1970s to the mid-1980s; more recent trends may be different. However, the increasing number of postsecondary students needing remediation suggests that completion rates may continue to decline, as remedial instruction increases the time required to complete a program. Other academic-based reforms noted in the Omnibus case studies, such as no longer awarding credit for remedial courses and no longer exempting certificate students from academic requirements, also increase the time required for some students to earn their credentials. These trends emphasize the need to focus on the most fundamental determinant of access to postsecondary education — students' **preparation for** further education.

The evidence on completion rates also implies a challenge for tech-prep programs. While postsecondary vocational programs appear to be doing a relatively good job graduating their students (relative to academic programs), they are not graduating students in the timeframe or at the rates envisioned by tech-prep programs. For this reason and others, it would be beneficial to find ways to move students through postsecondary vocational programs more efficiently and effectively.

ENDNOTES

[1] Section 403 (b) (4).

[2] Unless otherwise noted, all participation data in this chapter are for undergraduate enrollments only.

[3] Most postsecondary data do not distinguish between vocational and academic programs or students. The NPSAS does, but includes only two points in time. We use Department of Education and Census Bureau data to present longer trends, and to address issues not as well covered by the NPSAS. These data distinguish between two-year and four-year institutions and between Associate and Bachelor degrees. This is not a clean vocational-academic distinction, but is the best available for many long-term trend analyses. All enrollment data are based on student headcounts.

[4] Grubb, W.N. (1993), The long-run effects of proprietary schools on wages and earnings: Implications for federal policy, *Education Evaluation and Policy Analysis, 15 (1)*, 17–33.

[5] Murphy, K., & Welch, F. (1989), Wage premiums for college graduates: Recent growth and possible explanations, *Educational Researcher*, May, 17–26.

[6] This chapter examines only formal degree- or certificate-granting education and training institutions. We exclude employer/industry training, military training, or vocational training provided by community-based organizations.

[7] Many institutions also serve students who do not have a high school diploma, but this is still a useful measure of the expected level of preparation for most programs.

[8] Alsalam, N., Fischer, G.E., Ogle, L.T., Rogers, G.T., & Smith, T.M. (1992) *The Condition of Education*, p. 58. Washington, DC: U.S. Department of Education.

[9] Milne, A., et al. (1993). *Vocational Education in Communities*, p. 38. Draft report prepared for the National Assessment of Vocational Education. Rockville, MD: Westat, Inc.

[10] Ibid.

[11] Alsalam, N., Fischer, G.E., Ogle, L.T., Rogers, G.T., & Smith, T.M. (1993), *The Condition of Education*, Washington, DC: U.S. Department of Education; Kirshstein, R.J. et al. (1990), *The Escalating Costs of Higher Education*, Washington, DC: Pelavin Associates.

[12] Kirshstein, op. cit.; National Commission on Responsibilities for Financing Postsecondary Education (1993), *Making College Affordable Again*, Washington, DC: Author.

[13] Ibid.

[14] Alsalam, et al. (1993). op. cit., p. 32.

[15] National Center for Education Statistics (1992), *Digest of Education Statistics*, p. 307. Washington, DC: U.S. Department of Education.

[16] National Commission on Responsibilities for Financing Postsecondary Education, op. cit.

17 These trends may have reversed in recent years, as state budget crises have reduced many states' support for community colleges, thereby necessitating further tuition increases.

18 This section draws heavily from a literature review commissioned for the National Assessment on the topic of access to postsecondary vocational education for LEP adults (J.E. Friedenberg (1991), *Participation by Limited English Proficient Adults and Out-of-School Youths in Vocational/Technical Education: A Review of Related Literature*, San Marcos, CA: California State University, San Marcos.)

19 Association for School, College, and University Staffing (1993). *Teacher Supply and Demand in the United States, 1993 Report*. Evanston, IL: Author. These data show shortages at the secondary level, but it seems safe to assume that the shortage would also extend to the postsecondary level.

20 Milne, et al., op. cit.

21 National Association of Bilingual Education, *NAVE News*, Nov. 15, 1992.

22 O'Harrow, R., "Opening Doors to Success." *Washington Post*, Oct. 11, 1993, pp. A1, A8.

23 These NPSAS-derived proportions differ from those generated from U.S. Department of Education IPEDS data because the IPEDS includes only institutions accredited by a federally recognized accreditation agency. This excludes many less-than-four-year institutions, so IPEDS data suggest a larger enrollment share for the four-year sector.

24 Tuma, J. (1993), *Patterns of Enrollment in Postsecondary Vocational and Academic Education*, Draft report prepared for the National Assessment of Vocational Education. Berkeley, CA: MPR Associates.

25 Tuma, op. cit.

26 U.S. Bureau of the Census (1989), *Statistical Abstracts of the United States, 1989*, p. 13, Table No. 13, Washington, DC: U.S. Department of Commerce.

27 Fraas, C. (1990), *Proprietary Schools and Student Financial Aid Programs: Background and Policy Issues* (Report 90-427 EPW). Washington, DC: Library of Congress, Congressional Research Service.

28 Tuma, op. cit. Table 2.2.

29 Tuma, op. cit.

30 U.S. Bureau of the Census (1992), *Statistical Abstracts of the United States, 1992*, Table No. 630, Washington, DC: U.S. Department of Commerce.

31 Alsalam, et al. (1992), p. 321.

32 For example, the two-year institution attendance rate for 16–24 year olds has increased, while that for 25–34 year olds has remained relatively stable (Ibid., pp. 30–31).

33 Ibid., p. 66; National Center for Education Statistics (1992), pp. 172, 184, 241.

[34] Tuma, op. cit.

[35] National Center for Education Statistics (1992), p. 109.

[36] Ibid., p. 184.

[37] Ibid., p. 178.

[38] National Center for Education Statistics (1987), *Digest of Education Statistics*, p. 217, Washington, DC: U.S. Department of Education; National Center for Education Statistics (1991), *Digest of Education Statistics*, p. 237, Washington, DC: U.S. Department of Education.

[39] Based on analysis of 1989 NPSAS data.

[40] Tuma, op. cit.

[41] Seventy percent of proprietary institutions are in urban areas, as are 54% of private and 37% of public less-than-four-year institutions (based on College Board survey of all institutions in 1991–92).

[42] Alsalam, et al. (1992), p. 295.

[43] National Center for Education Statistics (1992), p. 204.

[44] Ibid., p. 185.

[45] It is commonly assumed that self-defined disability measures underestimate this population, as students are often reticent to identify themselves as disabled. The Final Report will provide an analysis of disabled students' transition to postsecondary participation from the National Longitudinal Transition Study, which uses more reliable indicators of disability status.

[46] Tuma, op. cit.

[47] These findings are based on the National Longitudinal Survey of 1972 (NLS) and the 1980 High School and Beyond (HSB), longitudinal studies that collected transcripts from high school students who later enrolled in postsecondary education. These data permit us to compare the ratio of male to female enrollments in different vocational fields; since these data are for 1972 and 1980 high school graduates, they show postsecondary enrollments shifts from about the mid-1970s to the mid-1980s.

[48] Both the 1972 NLS and the 1980 HSB track secondary students who enter postsecondary institutions within four years of high school graduation. A third study of a parallel cohort, the National Education Longitudinal Study of 1988, will not have postsecondary completion data until 1994, too late for this assessment. The BPS provides data on students who entered postsecondary education for the first time in 1989–90, with follow-up data two to two and one-half years after entry (in February 1992).

[49] Final rates were calculated by adding persistence rates to completion rates. The assumption of balanced losses and returns may lead to overestimates of true final completion rates (see D. Goodwin (1989), *Postsecondary Vocational Education*).

[50] C. Adelman (1990). The data game. *Change*, May/June 1990, 44–45.

[51] Goodwin, op. cit.; Grubb, W.N. (1989), Dropouts, spells of time, and credits in postsecondary education: Evidence from longitudinal surveys, *Economics of Educational Research, 8(1)*, 49–67.

[52] Grubb (1989), op. cit.

[53] Ibid.

CHAPTER 6

STATE AND LOCAL RESPONSIBILITIES CONCERNING SPECIAL POPULATIONS

INTRODUCTION

Federal vocational education legislation has a 25-year tradition of attention to the needs of disadvantaged and disabled students. However, the main method of serving these students, set-aside funds, was abolished in the 1990 Perkins Act. To ensure that this change does not result in a loss of attention to special population students, the 1990 Perkins Act expanded state and local requirements and responsibilities regarding these students.[1] In this chapter, we assess the extent to which states and localities are fulfilling these responsibilities. Many relevant state-level obligations were discussed in Chapter 3. We summarize those findings here, and supplement them with information on other responsibilities.

We first examine states' efforts to provide localities with guidance on equal access, their monitoring of special population student enrollments, and the activities of state representatives for special population students. As we will see, all but a few states appear to be fulfilling their responsibilities toward special population students. Compliance rates are about 85–95 percent on most activities that are clearly mandated by the Perkins Act, but significantly lower for activities that are less clearly or specifically mandated, or are new to the 1990 Act. States' assistance to localities on equal access is not very strong, but this appears to be part of a larger problem in providing sufficient assistance to localities. Another state weakness is in efforts to adjust performance measures to account for different concentrations of special population students; too few states are taking these steps.

At the local level, we examine input into local planning efforts. We find that school districts could improve their efforts to seek input into Perkins planning, from special population representatives as well as others. We also examine supplemental services for special population students, assessing the effects of the current Perkins funding approach on service provision.

This section reveals that guidance, counseling, and assessment are the most commonly offered services at both secondary and postsecondary levels. Perkins-funded localities are found to offer a wide range of supplemental services, and more than their unfunded counterparts. There is no evidence that service provision has been adversely affected by changes in Perkins funding allocations. However, the value of non-instructional services (such as recruitment, counseling, and assessment) compared to other efforts more directly focused on program improvement is questioned.

STATE RESPONSIBILITIES FOR SPECIAL POPULATION STUDENTS

The Perkins Act gives state offices of vocational education a number of responsibilities concerning special population students, including:

> (a) Requirements for input of state personnel responsible for disabled, disadvantaged and limited English proficient (LEP) student programs in the review of local plans [2] and the selection of the committees of practitioners (who develop the state system of performance standards and measures). [3]
>
> (b) Adjustments of the state performance standards and measures system "to encourage service to targeted groups or special populations." [4]
>
> (c) Assurances that the state will monitor the degree to which the needs of special population students are met.[5]
>
> (d) Assurances that the state will guarantee equal access to quality vocational education programs for special population students and will establish procedures for community input at the state and local levels. [6]

The clear intent of these mandates is to guarantee that each state involves special population representatives in planning and implementing the Perkins Act, and that each state plays a proactive role in ensuring equal access to vocational programs, particularly those of high quality, for special population students.

In this section, we examine the extent to which states fulfill these responsibilities, using Omnibus Survey data obtained from state and local vocational education administrators. We divide states' responsibilities into two types: activities within state agencies (e.g., data collection), and state assistance to localities. These are examined first at the secondary level and then at the postsecondary level.

Secondary-Level Activities Within State Agencies

We saw in Chapter 3 that responsibilities concerning special populations are one of the most prevalent activities in secondary state offices of vocational education, second only to the measurement of student performance. Further, these responsibilities have increased in most states, particularly in states that have not had staff reductions. These data suggest that state offices of vocational education are, on the whole, responsive to Perkins concerns that states address the needs of these students. How well are the states doing in other areas?

Monitoring Participation. The Perkins Act requires that states monitor the access of special population students to vocational education. One of the most basic ways to do this is to monitor student participation in vocational education. This is almost universally done. In 1991–92, only one state did not collect information on the participation of secondary-level disadvantaged, disabled, or LEP students in vocational education. All other states collect information on all three types of students.

Not surprisingly, vocational enrollment data are collected more often than are the more useful (but more complicated) data on vocational program completers (see Figure 6.1). Over 90 percent of the states collect enrollment data, but less than 80 percent collect completion data. Student-level data (i.e., data collected from students), which typically provide the richest source of information for monitoring students, are collected by just under half of the states.

State monitoring of the access and participation of special population students also requires that localities use consistent, standardized definitions for these student groups. Without these, the reported data are unlikely to be comparable, and can be compromised through the use of inappropriate definitions. Thus, providing definitions for localities to use is an essential part of any state effort to collect valid and reliable information on special population students.

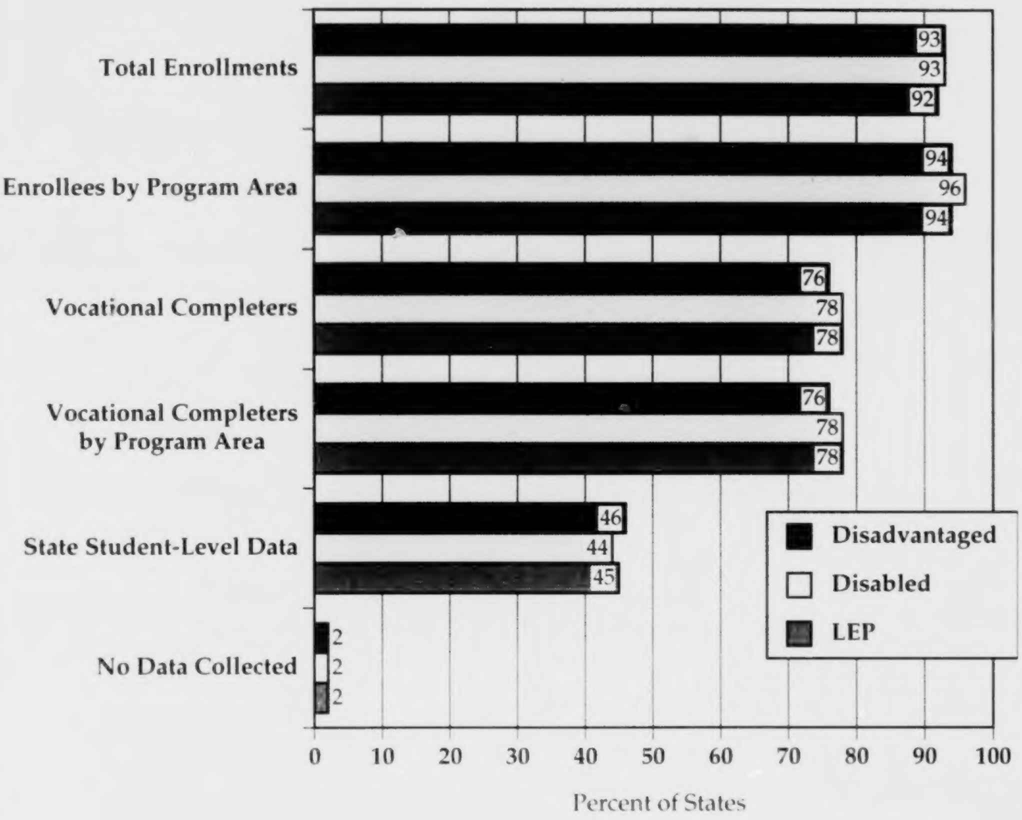
In 1991–92, most states (91%) provided standard definitions for localities to use in defining the three major special population groups (disadvantaged, disabled, and LEP students). However, four states do not have definitions for any of these students, and one has a definition only for disabled students. These five states are unlikely to be able to collect valid state-level data until standard definitions are adopted.

Input of State Special Population Representatives. All 50 states and two U.S. territories are required by the Perkins Act to have the following individuals review localities' Perkins applications:

> (1) the state official responsible for Part B of IDEA (disabled students' representative);
>
> (2) the state official responsible for Chapter 1 of Title I of the ESEA (disadvantaged students' representative); and
>
> (3) the state official responsible for LEP student programs (LEP students' representative).

Forty-three state administrators (83%) report that all three of these individuals reviewed local applications. However, in five states none of them were involved in the review, and in three other states only one or two were involved. This

Figure 6.1
Percentage of States Collecting Data on Rates of Participation by Secondary Special Population Students, by Type of Student

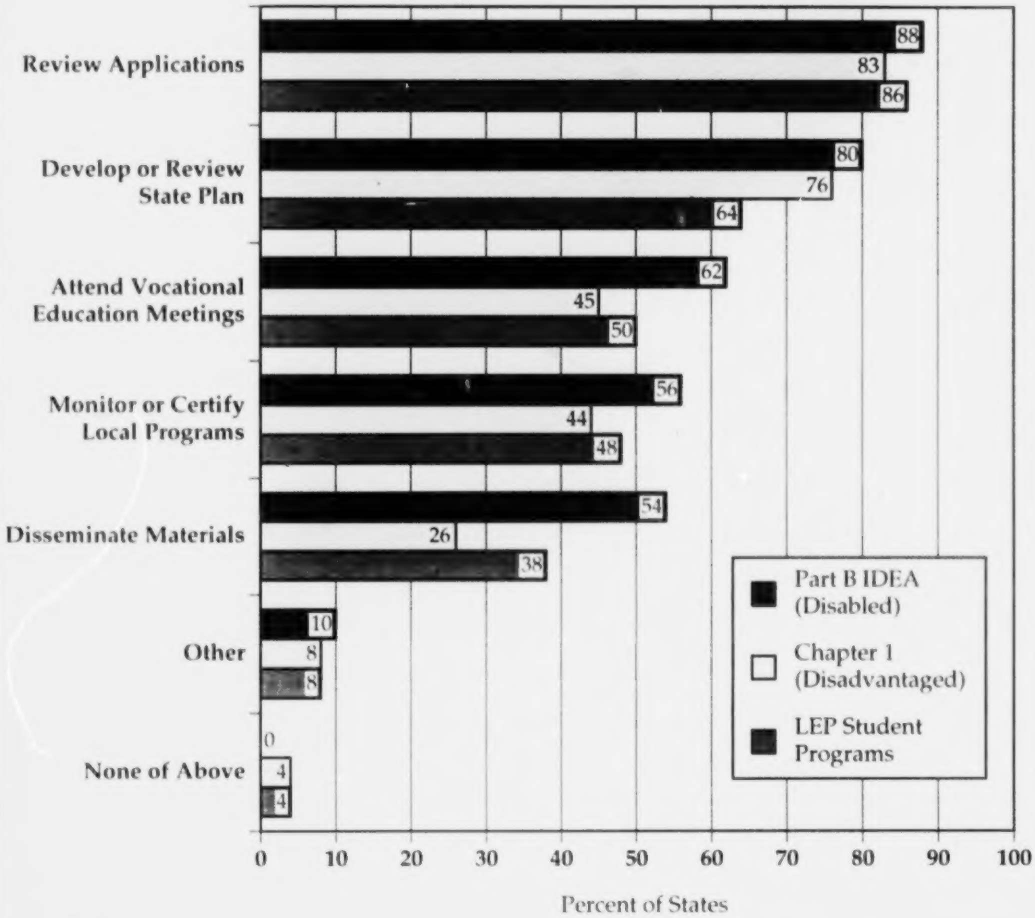


Source: Omnibus Secondary State Survey

obviously does not represent 100 percent compliance with the law, as at least eight states are not in full compliance. (Data are missing for one state.)

Levels of involvement are significantly lower for activities that relate to other Perkins mandates (see Figure 6.2 and Appendix Table A-6.1). The Perkins Act requires that state special population representatives supervise the implementation of the Act, and that states appropriately monitor the provision of vocational education to special population students. [7] These assurances imply that special population representatives should have input into the Perkins state plan and should monitor local programs.

Figure 6.2
States Reporting Perkins Planning Roles of State Officials Responsible for Special Population Groups, by Official's Responsibility



Source: Omnibus Secondary State Survey

In fact, these representatives help develop or review Perkins plans in no more than 80 percent of the states (39 or 40 of 50 reporting) and monitor or certify local programs in just over half of the states (22 to 28 states). To some extent, these lower levels of compliance may reflect time constraints on increasingly burdened state officials—a factor often overlooked in federal legislation.

Levels of involvement also vary among these three representatives. In general, the state official responsible for disabled students has the highest level of involvement with Perkins activities, and the person responsible for disadvantaged students has the lowest level. The difference between the disabled student representative and the others most likely reflects the Perkins Act's specific mandates for coordination with special education and the requirements of the (then) Education of the Handicapped Act.[8] The focus of Chapter 1 and Title VII programs at the elementary level may contribute to the lesser involvement of these representatives in secondary vocational programs.

Input Into the Development of Performance Standards and Measures. The Perkins Act does not mandate that special population representatives be directly involved in developing the state system of performance standards and measures. However, their input is strongly implied by the uses to which this system is to be put (i.e., monitoring special population students' participation and success in vocational education) and by requirements to include incentives or adjustments for special populations.

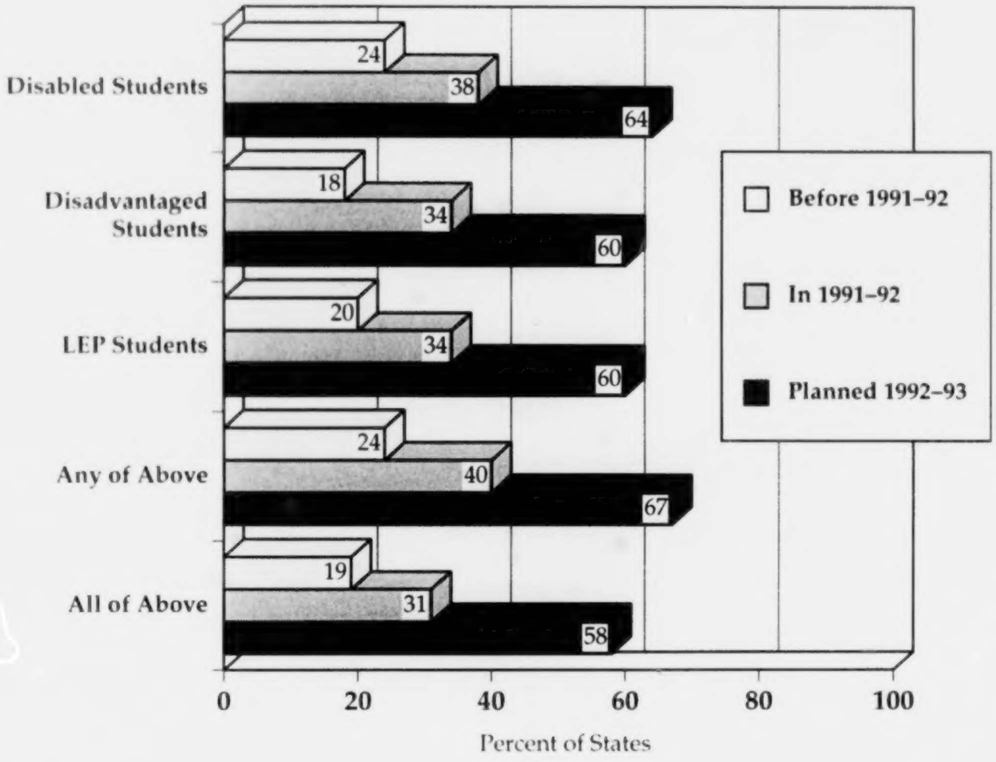
The Omnibus Surveys reveal that representatives of special populations were consulted in the process of developing performance standards and measures in most states. Only one (of 52 responding) states reported that these individuals were not involved, while eight states reported that they were consulted once or twice. In 43 states special population representatives were consulted regularly or "played a major role."

On average, the involvement of special population representatives was lower than that of state and local vocational education officials, about the same as that of school administrators, and higher than that of employer representatives, parents, and students (see Appendix Table A-6.2). Overall, these data suggest that special population representatives typically have a fairly high level of involvement in the development of the vocational performance measurement system.

As mentioned above, the Perkins Act also mandates that the performance measurement system include incentives or adjustments to encourage "targeted groups" or special population students to enroll in vocational education. This provision is critical, because the pressure to have favorable performance assessment outcomes can lead to "creaming" — to localities enrolling only the higher achieving or most employable students in vocational education programs. One way to avoid this problem is to adjust the performance standards to take into account the level of special population student enrollments; for example, comparing the performance of school districts that enroll about the same proportions of vocational special population students to each other, rather than to all districts or the "average" district.

As of 1991–92, fewer than half of the states had made adjustments for any of the three main special population student groups, while about two-thirds planned to make some adjustments in 1992–93 (see Figure 6.3). It is too soon to tell whether states will follow through on their plans to incorporate adjustments for special

Figure 6.3
States Establishing Procedures to Adjust Performance Standards for Secondary Special Population Groups, by Year



Source: Omnibus Secondary State Survey

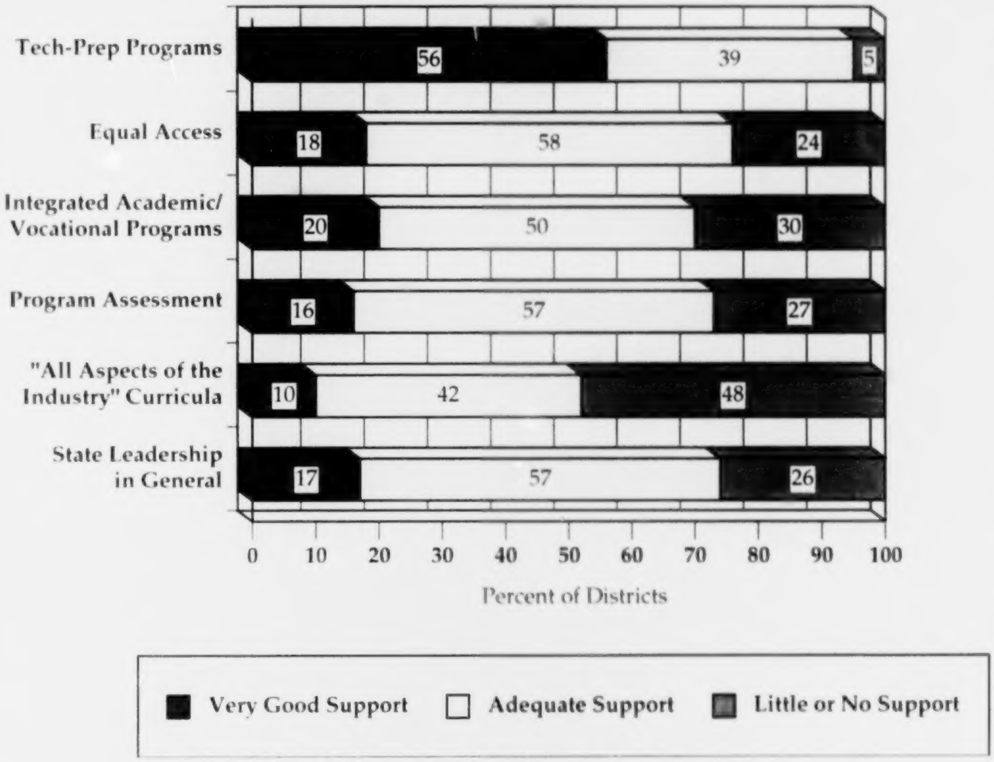
population students; the Omnibus Follow-Up Survey will provide information on this issue.

A larger issue could emerge if, in the long run, only two-thirds of the states make these adjustments. This could lead to tensions between equal access and accountability in the one-third of states that do not include adjustments. Vocational programs might be tempted to exclude special population students in order to score well in performance measurements.

Secondary-Level State Assistance to Localities

In Chapter 3, we saw that districts reported limited state support for their Perkins implementation efforts. This is also true among only those districts that received Perkins basic grant funds (see Figure 6.4). With regard to special

Figure 6.4
State Support to Perkins-Funded Districts for Each Vocational Education Activity



Source: Omnibus District Surveys, Versions, A, B, and Vocational

population students, only 18 percent of Perkins-funded districts felt that state guidance on procedures for providing equal access was "very good"; 58 percent rated it "adequate" and 24 percent said they had received "little or no support" on this issue.

Districts thus viewed state efforts in promoting equal access as slightly less than adequate on average, with room for improvement in most cases. However, state support for equal access was rated second only to that for tech prep, suggesting that the problem is more one of insufficient state support in general, than of insufficient support for equal access in particular. This conclusion is consistent with data on levels of in-service training (also discussed in Chapter 3), which are low overall, but which include "serving vocational special needs students" as one of the most frequent topics.

States seem to be better at providing districts with basic information concerning equal access than at providing more general support for access. Most states report that they currently furnish localities with written procedures or guidelines concerning the provision of equal access, and even more plan to do so in the future. Both before and during 1991–92, about 80 percent of states reported that they provide such materials; 90 percent (47 of 52) plan to provide them by 1992–93. (Appendix Table A-6.3 gives more detail on the types of assistance states offer).

At the postsecondary level, the Omnibus Survey contains questions parallel to those at the secondary level on activities within state agencies, and on providing localities with written guidance or information on equal access. As the next sections show, the postsecondary data mirror the secondary data, although slightly lower levels of state leadership and support are evident on some measures.

Postsecondary-Level Activities Within State Agencies

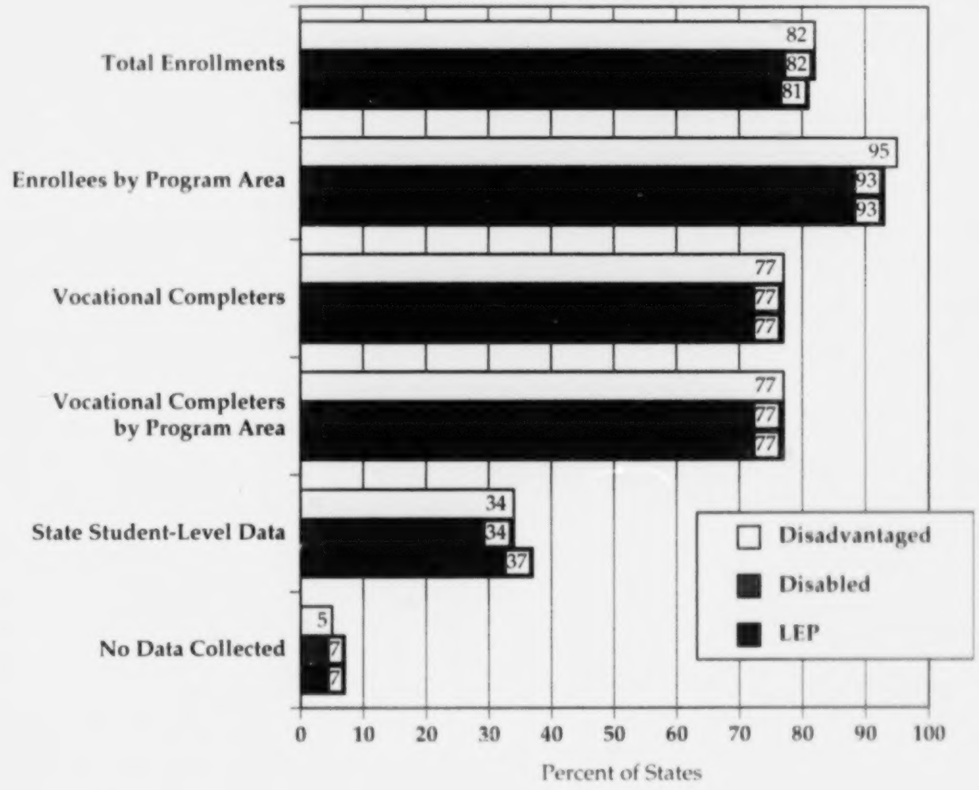
Chapter 3 shows that most state offices of postsecondary vocational education report activities related to "responsibilities concerning special populations," and most report an increase in these responsibilities from Spring 1990 to Spring 1992 . As at the secondary level, this was one of the areas of greatest activity as well as increase in activity, second only to the development of performance standards and measures.

Monitoring Participation. All but two states collect postsecondary vocational participation data on disadvantaged, disabled, and LEP students. As at the secondary level, enrollment data are the most commonly collected information, and student-level data are least commonly collected (see Figure 6.5). Total vocational enrollments and statewide student data are less frequently collected at the postsecondary level than at the secondary level; other types of data are collected about equally as often.

Slightly fewer states than at the secondary level provide standard definitions of special population students. Eighty-five percent (40 of 47) of postsecondary state agencies have definitions for all three student groups, compared to 91 percent of secondary agencies. Five states provide no definitions for postsecondary institutions and two states have definitions for only one or two of these groups. Thus, at least seven states are unlikely to collect valid state-level data.

Input Into the Development of Performance Standards and Measures. As at the secondary level, special population representatives were one of the more frequently consulted groups during the development of the state performance measurement system (see Appendix Table A-6.4). In three-quarters of the states these representatives were consulted regularly or played a major role in this process. In eight states they were consulted only once or twice, and in three states

Figure 6.5
States Collecting Data on Rates of Participation by Postsecondary Special Population Students, by Type of Student



Source: Omnibus Postsecondary State Survey

they were not consulted at all. This is a slightly lower level of involvement than in secondary education. However, the postsecondary planning process seems to have less involvement by many groups (e.g., employers, students, unions).

Procedures for adjusting the performance measurement system for special population students are also somewhat less common at the postsecondary level. For example, 19 percent of state secondary agencies adjusted for all three major special population groups prior to 1991–92 and 58 percent planned to do so by 1992–93. At the postsecondary level, 16 percent initially made these adjustments, and only 50 percent planned to by 1992–93 (see Figure 6.6). These data again raise the concern of possible "creaming" within those states that do not account for differing concentrations of special population students in their performance measurement systems.

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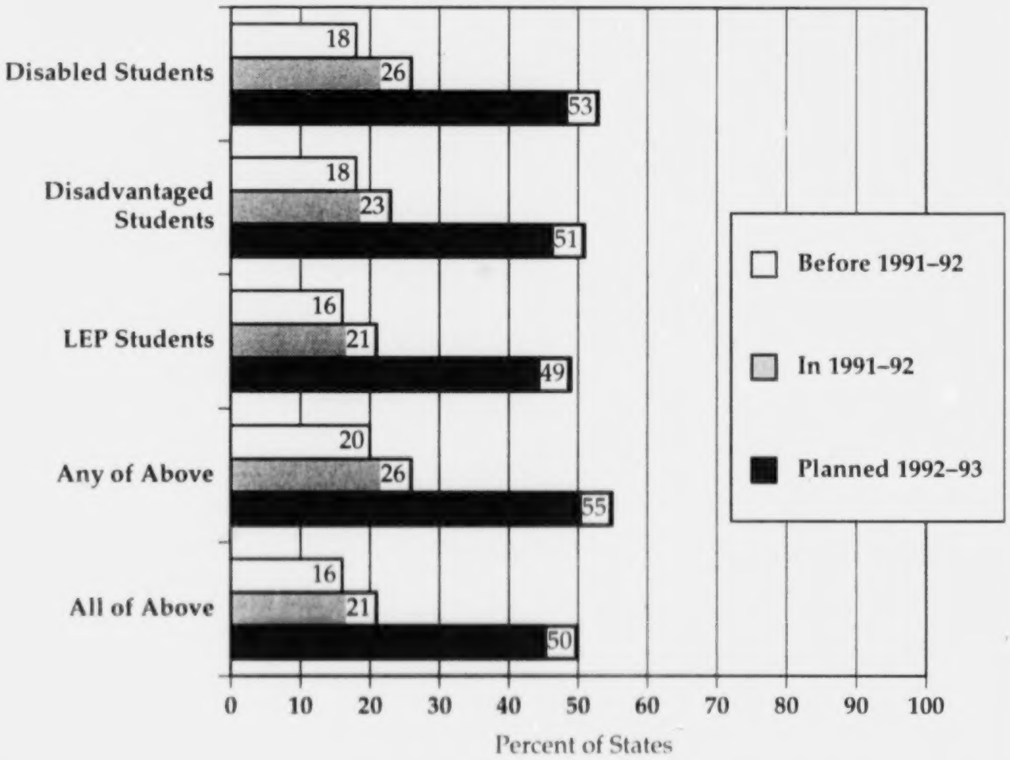
Figure 6.6
States Establishing Procedures to Adjust Performance Standards for Postsecondary Special Population Groups, by Year



Source: Omnibus Postsecondary State Survey

Postsecondary State Assistance to Localities

Postsecondary institutions are typically more independent of their state education agencies than secondary districts are. As a result, postsecondary agencies do not play the same support role as secondary agencies. For example, postsecondary institutions do not usually turn to their state offices for in-service training or curriculum development. However, postsecondary agencies are still responsible for issuing guidance on compliance with relevant state and federal policies, including the Perkins Act. Thus, the Omnibus Surveys asked states whether they provide postsecondary institutions with written procedures or guidelines concerning equal access.

Only 28 postsecondary agencies (62%) had provided systematic information on equal access before 1991–92, and only one additional state did so in 1991–92. The number will increase to 38 states (84%) in 1992–93, if current plans are enacted. State secondary agencies have been much more active, although differences between the two are shrinking. Before 1991–92, 81 percent of state secondary agencies had issued guidelines or procedures, and in 1992–93, 90 percent will have done so. (Appendix Table A-6.5 lists the types of assistance that states provide postsecondary institutions.)

LOCAL RESPONSIBILITIES FOR SPECIAL POPULATION STUDENTS

This section examines local responsibilities concerning special population students, based on Omnibus Survey data from school districts, secondary schools, and two-year postsecondary institutions. In accordance with the emphasis in the Perkins Act, we focus on supplemental services for special population students. We examine the prevalence and type of services provided for special population students, the extent to which Perkins funding increases service provision, and the effect of the elimination of the set-aside funds on service provision. This section also examines, at the secondary level, the extent to which representatives for special populations are involved in the local Perkins planning and implementation process. The following section reviews Omnibus case study findings on services for special population students.

Services for Special Population Students[9]

The Perkins Act stresses the assurance of equal access to vocational education for special population students through the provision of supplemental services, equipment, and other forms of support necessary to permit these students to participate fully in vocational programs. Physically disabled students, for example, may require modified equipment or facilities; learning disabled students may require teacher aides; and LEP students may require bilingual vocational training or English-as-a-second-language (ESL) instruction.

The Omnibus Surveys included lists of supplemental services that can be offered for vocational special needs students. Individual lists were provided for disabled students, educationally and economically disadvantaged students, and LEP students (see Appendix Table A-6.6). District and postsecondary administrators were asked if each service was offered in 1990–91 and in 1991–92, and how each service had changed from one year to the next. We use these data to examine the overall level of services offered to vocational special needs students, and how Perkins Act funding relates to service provision.

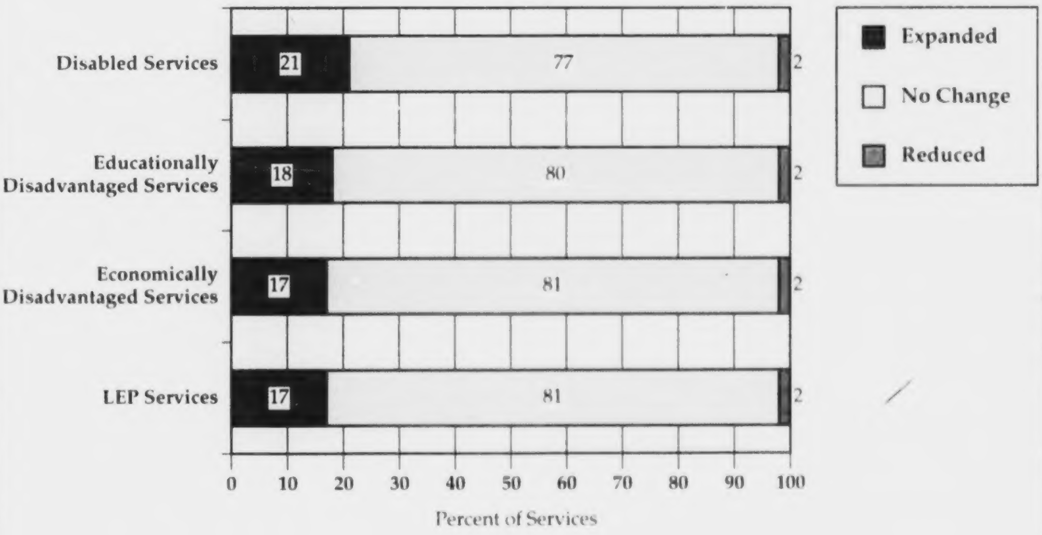
Secondary-Level Services for Special Population Students[10]

Districts most often provided supplemental services for disabled and disadvantaged students. On average, 69 percent of the services listed for disabled students were offered by districts, compared to 63 percent of the services for economically disadvantaged and educationally disadvantaged students, and 57 percent of those listed for LEP students.

For all types of special needs students, the most commonly offered services are guidance, counseling, and assessment. Typically, over 90 percent of districts offer these services for each type of student. Tutoring and job placement services are also widely available for disabled and disadvantaged students (offered by 70–90% of districts), but less likely to be available for LEP students (around 50%). Other more specialized services are more variable in their availability, with more costly services such as the use of paraprofessionals and child care being the least available, typically offered in one-fourth to one-third of all districts. The General Accounting Office found similar patterns of funds use in its evaluation of the 1990 Perkins Act.[11]

Changes in Services. In most districts, services remained unchanged from 1990–91 to 1991–92. However, when a service was changed, it was more likely to be expanded than reduced, so that on average the level of service availability increased from 1990–91 to 1991–92 (see Figure 6.7).

Figure 6.7
Changes in District Services from 1990–91 to 1991–92



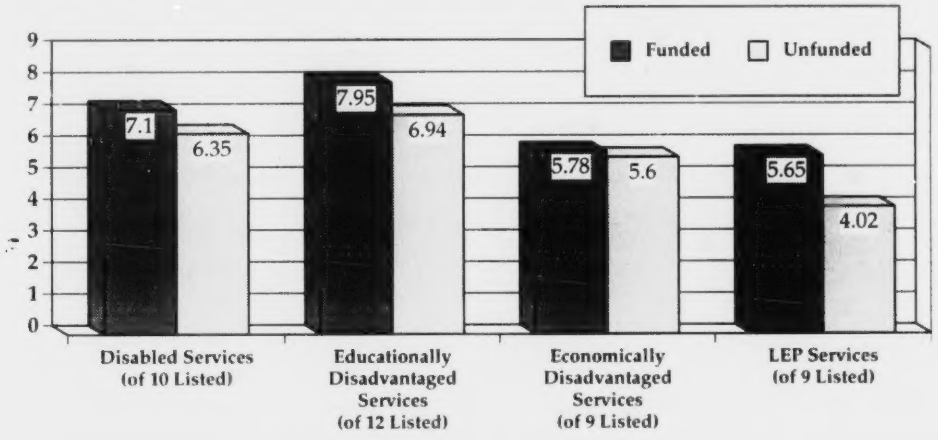
Source: Omnibus District Survey, Version A

The services most likely to be expanded were guidance, counseling, and assessment; about one-third of all districts reported expanding these services for each special population group. Job placement services were also likely to be expanded; about one-fifth to one-fourth of districts increased these services for each group. Too few districts (typically only 2–5%) had reduced any one service to reveal any pattern in service reductions.

Effects of the Perkins Act on Service Availability. Does the 1990 Perkins Act increase the availability of supplemental services for vocational special needs students? To answer this question, districts were divided into two groups: those that received Perkins Title II basic grant funds, and those that did not. The number of services offered in funded and unfunded districts was then compared to reveal the relationship between Perkins funding and service availability.

Figure 6.8 shows that, on average, Perkins-funded districts offer more services for disabled students, educationally disadvantaged students, and LEP students than do unfunded districts. Both types of districts offer the same number of services for economically disadvantaged students.

Figure 6.8
Average Number of Services Offered by Districts in 1991–92, by District Perkins Funding Status



Source: Omnibus District Survey, Version A

The greater service availability for educationally disadvantaged but not economically disadvantaged students suggests that Perkins-funded districts may concentrate their efforts on services to address educational rather than economic handicaps. As noted in the previous National Assessment, schools are understandably wary of singling students out on the basis of characteristics other than achievement.[12]

While these data are encouraging, they may be misleading. Funded districts tend to be larger than unfunded districts and to have more special needs students. Larger districts and districts with more special needs students also tend to provide more supplemental services. This raises the question of whether funded districts provide more services because they receive Perkins funds or just because they have these other characteristics.

To sort out these potential causes, we used multiple regression procedures to compare the number of services offered in funded and unfunded districts, with district size and the concentration of special needs students held constant.

The analyses show that among districts of the same size and with the same proportion of disabled, disadvantaged, or LEP students, funded districts offer significantly more services for each special population group than do unfunded districts (see Table 6.1).[13] Funded districts offer an average of .67 additional services for disabled students, 1.02 for disadvantaged students, and 1.66 for LEP students. This higher level of service provision is not due to differences in district size or student composition, suggesting that Perkins funding contributes to a higher level of service provision.

A closer look at the services provided in funded versus unfunded districts shows that funded districts are more likely than unfunded districts to offer most services listed, **except for** guidance and counseling, assessment services, and tutoring. This lack of effect is most likely due to the overwhelming availability of guidance, counseling, and assessment in both funded and unfunded districts (leaving little room for significant increase).

This analysis suggests that Perkins funds do increase the range of services offered to vocational special needs students. But this increase does not appear to be entirely a result of the **1990** Perkins Act. Many of the disabled and disadvantaged student services that are more available in funded districts in 1991–92 have not been expanded more in these districts than in unfunded districts. Hence, funded districts were already more likely to offer these services before receiving 1990 Perkins funds. Since most of the districts that received 1990 Perkins funds also had Perkins funds prior to 1991–92, these services are most likely pre-existing Perkins-funded services that are **maintained** with 1990 Perkins Act funds, rather than services added with 1990 funds. However, as we will see below, other services—particularly LEP student services—do seem to have been **added** with 1990 Perkins funds.

Table 6.1
Predicted Number of Services Offered by Districts in 1991–92, by District Funding Status

	Average Number of Services Offered By District [a]	
	Funded in 1991–92	Not Funded in 1991–92
Disabled students	7.10	6.43
Disadvantaged students	10.23	9.21
LEP students	5.73	4.07

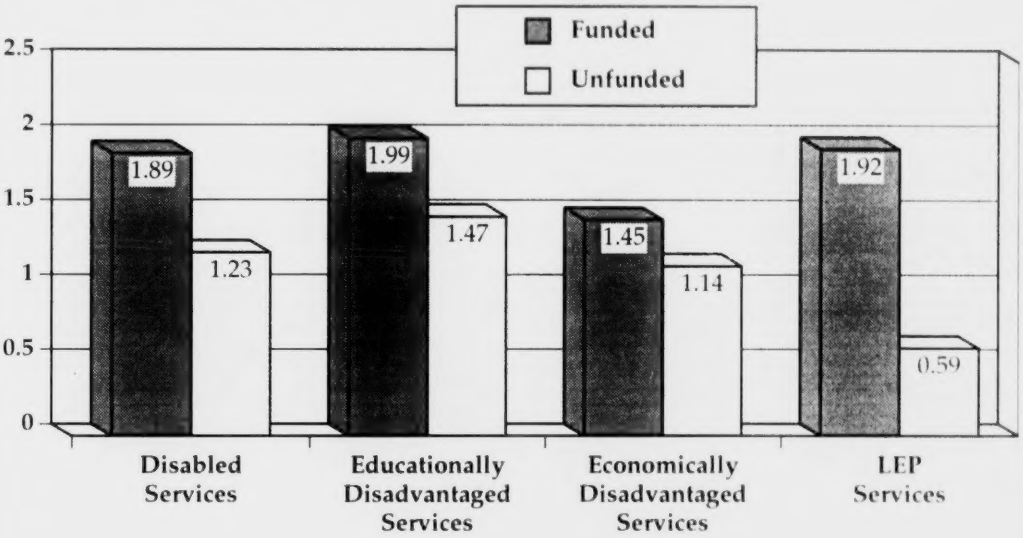
[a] Averages are for districts of average size and with an average percentage of disabled, disadvantaged, or LEP students. All differences between funded and unfunded districts are significant at p<.01.

Source: Omnibus District Survey, Version A

Elimination of Set-Aside Funds. To determine whether the elimination of the set-asides resulted in a reduction of services, we compared two slightly different groups of districts: those funded in both 1990–91 and 1991–92, and those funded in neither year (using Perkins program improvement and disabled and disadvantaged set-aside funds for 1990–91 and local basic grant funds for 1991–92). Since the underlying issue is whether districts that formerly used set-aside funds for vocational special needs services have shifted their funds to other initiatives, we examine districts funded in both years to see if their level of service provision has decreased. Since factors other than Perkins can cause changes in service provision (e.g., fluctuations in state or local funding), we also examine how service availability has changed in funded districts compared to districts that did not have Perkins funding in either year.

Figure 6.9 shows that districts receiving Perkins funds in both 1990–91 and 1991–92 expanded services for vocational special needs students from one year to the next.[14] Moreover, funded districts increased their services at least as much as unfunded districts. In fact, for all groups except the economically disadvantaged, Perkins-funded districts increased their services significantly more than unfunded districts. This suggests that funded districts are not shifting Perkins funds from supplemental services to other uses (or that if they are, the services are maintained with other funds).

Figure 6.9
Average Change in Services from 1990–91 to 1991–92, by District Funding Status[a]



[a] See endnote 14 for explanation of change measure.

Source: Omnibus District Survey, Version A

These differences remain even when multiple regression is used to compare funded and unfunded districts with the same number of students and the same proportion of special needs students (see Table 6.2). Thus, the elimination of the set-aside funds does not appear to have resulted in a loss of supplemental services. In fact, for LEP students (and possibly disabled students), the level of services offered in funded districts increased beyond the "norm," suggesting that 1990 Perkins funds are being used to **increase** the services offered to these students—rather than merely maintaining services that had been available under the 1984 Perkins Act.

Looking at specific services, guidance, counseling, and assessment are those that funded districts are most likely to expand. In addition, virtually all services for LEP students have been expanded substantially in these districts. (See Appendix Table A-6.7)

Even though guidance, counseling, and assessment services are almost universally available in both funded and unfunded districts, their greater growth in funded districts suggests that these districts may offer qualitatively better

Table 6.2
Predicted Change in Special Population Services from 1990–91 to 1991–92, by District Funding Status

	Predicted Average Change [a]		
	Funded Both Years	Funded Neither Year	p-value
Disabled students	1.84	1.27	.06
Disadvantaged students	2.23	2.20	NS
LEP students	1.98	.61	<.01

[a] See endnote 14 for explanation of change measure. Predicted average change was calculated for districts of average size and with average concentration of special population students.

Source: Omnibus District Surveys, Version A

services than unfunded districts. We have tentative data suggesting that this is true: 61 percent of funded districts report that guidance counselors play a "large" or "moderate" role in finding jobs for students, against only 41 percent of unfunded districts. This emphasis on guidance is consistent with provisions of the Perkins Act. [15]

A final caveat. Because they are more likely to enroll special population students, Perkins-funded districts are also more likely than others to receive funds from other federal programs, such as ESEA Chapter 1 (for disadvantaged students), IDEA (for disabled students), or ESEA Title VII (for LEP students). In theory, it could be because they receive these other federal funds that Perkins-funded districts offer more services than unfunded districts.

However, the fact that funded districts provide more services even when district size and special population concentration are controlled suggests that the differences in service provision are not due to other federal funds (which should be equivalent in districts with comparable special population enrollments). Also, the greater expansion of services in funded districts cannot be explained by changes in other federal legislation from 1990–91 to 1991–92, as there were no major changes in the funding or implementation of Chapter 1, IDEA, or Title VII funds between those years. [16]

Participatory Planning at the Local Level

The equal access assurances of Section 118 of the Perkins Act require (among other things) that states establish procedures for parents, students, and other interested parties to participate in state and local decisions that "influence the character of programs under this Act." The role of special population representatives in state planning was discussed earlier. In this section, we look at the degree to which special population representatives have input at the local level on a range of Perkins planning and implementation activities.

As Figure 6.10 shows, special population representatives were **not** involved in any Perkins planning and implementation activities in 30 percent of all districts that submitted a local application for Perkins funding. However, they appear to have about the same level of input into each Perkins planning and implementation activity as do parents, and slightly less than employers.

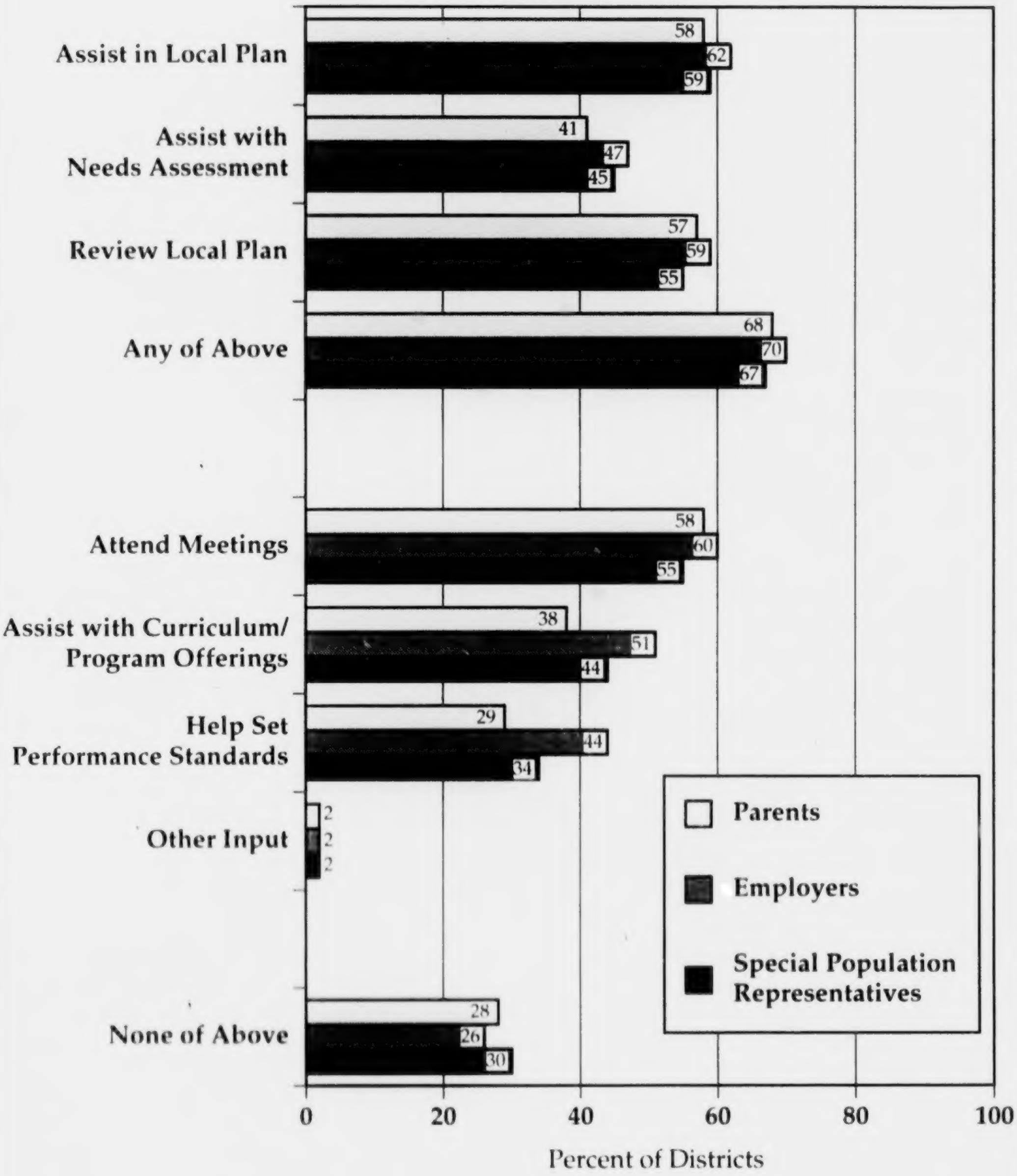
Most districts seek input from at least one of these groups, but few seek input from all three. This suggests that districts tend to think more narrowly about "local input" than the Perkins Act seems to imply—perhaps because of lack of specificity in the Act about requirements for local input. However, it is encouraging that special population representatives are consulted about as often as other local groups, suggesting that these individuals are as likely to be considered legitimate stakeholders in vocational education as are parents and employers.

Postsecondary-Level Services for Special Population Students

At the postsecondary level, our analysis of local roles and responsibilities focuses on the provision of supplemental services. In general, findings at the postsecondary level are similar to those at the secondary level. Postsecondary institutions offer guidance and assessment more often than other services, and services have increased, on average, from 1990–91 to 1991–92. Also, Perkins-funded postsecondary institutions offer more services than unfunded institutions, and they have increased services more than have unfunded institutions.

Supplemental Services. As at the secondary level, institutions most often offered services for disabled and disadvantaged students, with fewer services offered for LEP students; 70 percent of the listed disabled services were offered in 1991–92, as were 66 percent of disadvantaged student services, and 55 percent of LEP services. The most commonly offered services for all types of students were again guidance and assessment, offered by over 90 percent of institutions for disabled and disadvantaged students, and over 80 percent for LEP students. Job placement services, remedial instruction, and tutoring for disadvantaged students were also widespread. Again, these findings are similar to those obtained by the General Accounting Office.[17]

Figure 6.10
Input Into Various Perkins Activities by Local Representatives in Districts Preparing Local Plans



Source: Omnibus District Survey, Versions A, B, and Vocational

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Changes in Services. The pattern of changes observed at the secondary level was also observed at the postsecondary level. Services remained at the same level in most institutions from 1990–91 to 1991–92, but on average services expanded from one year to the next (see Figure 6.11). However, postsecondary institutions have expanded services for disabled and disadvantaged students more than secondary districts. While 30 percent of disabled student services were expanded at the postsecondary level, only 21 percent were expanded at the secondary level; similar figures for disadvantaged students are 29 percent and 18 percent, and for LEP students, 20 percent and 17 percent.

The services most likely to have been expanded at the postsecondary level are the same services that are most commonly offered: guidance and counseling, assessment, job placement, and remedial instruction and tutoring services for disadvantaged students. Again, reductions of services were too infrequent to suggest any pattern in the types of services reduced.

Effects of the Perkins Act on Service Availability. As was true at the secondary level, Perkins-funded institutions offer significantly more services for disabled students, disadvantaged students, and LEP students than do unfunded institutions (see Figure 6.12).

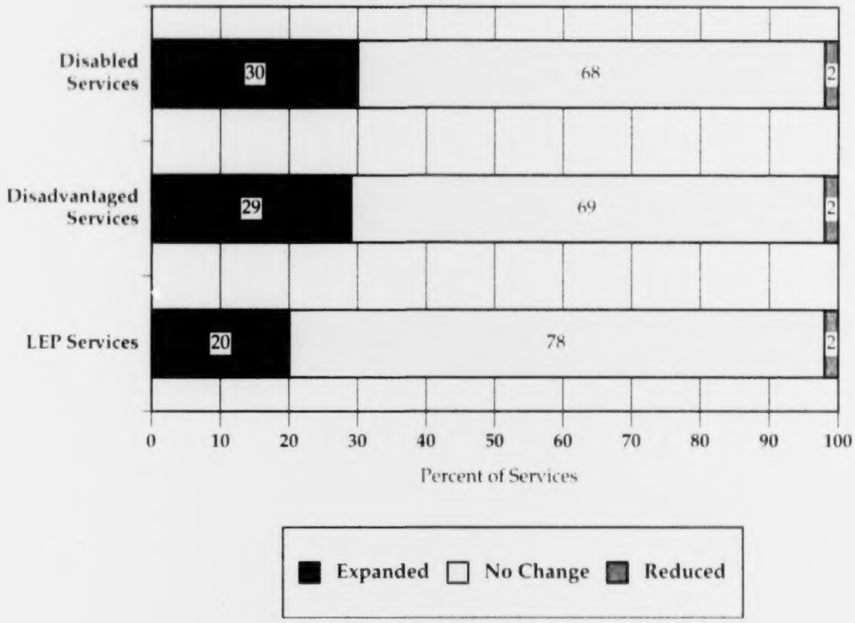
Again, funded institutions tend to be larger and have more special needs students, and both larger institutions and those with more special needs students offer more services, raising the question of whether funded institutions offer more services because of Perkins funds, or simply because they are larger and enroll more special needs students. Multiple regression was again used to determine the effect of funding independent of institution size and special population concentration.

As at the secondary level, funded institutions provide significantly more supplemental services than unfunded institutions, even when institution size and the proportion of special needs students are held constant (see Table 6.3). On average, funded institutions provide about .8 more services for disabled and disadvantaged students than do unfunded institutions of comparable size and special population concentration, and .7 more services for LEP students.[18]

In general, funded institutions are more likely than unfunded institutions to provide more costly specialized services, such as paraprofessionals or aides. For example, 57 percent of funded institutions provide paraprofessionals or aides for disabled students, compared to 41 percent of unfunded institutions. Funded institutions are also more likely to modify equipment or curricula for disabled students, to offer child care and job search activities for disadvantaged students, and to provide vocational assessment for LEP students.

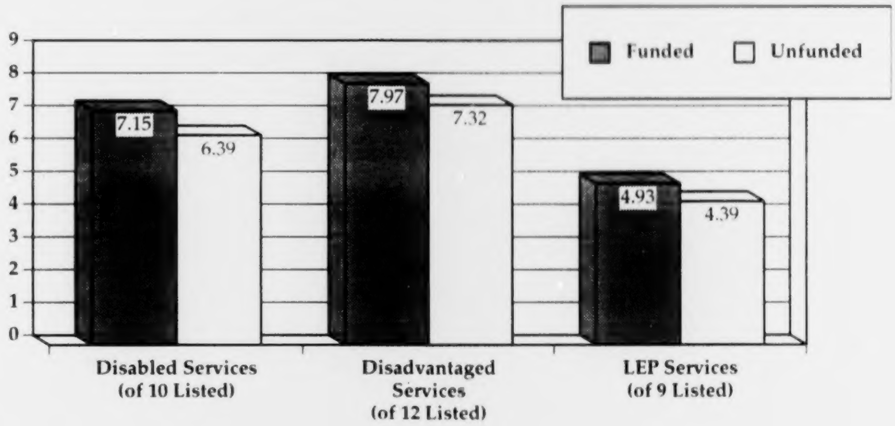
Elimination of the Set-Aside Funds. Comparing institutions funded in both 1990–91 and 1991–92 to institutions that were not funded in either year reveals

Figure 6.11
Changes in Postsecondary Institution Services from 1990–91 to 1991–92



Source: Omnibus Postsecondary Institution Survey

Figure 6.12
Average Number of Services Offered by Institutions in 1991–92, by Institutions' Perkins Funding Status



Source: Omnibus Postsecondary Institution Survey

Table 6.3
Predicted Number of Services Offered by Institutions in 1991-92, by Institution Funding Status

	Average Number of Services Offered By Institution [a]	
	Funded in 1991–92	Not Funded in 1991–92
Disabled students	7.18	6.36
Disadvantaged students	8.06	7.27
LEP students	4.94	4.23

[a] Averages are for districts of average size and with average percentage of disabled, disadvantaged, or LEP students. All differences between funded and unfunded institutions are significantly different at p<.01.

Source: Omnibus Postsecondary Institution Survey

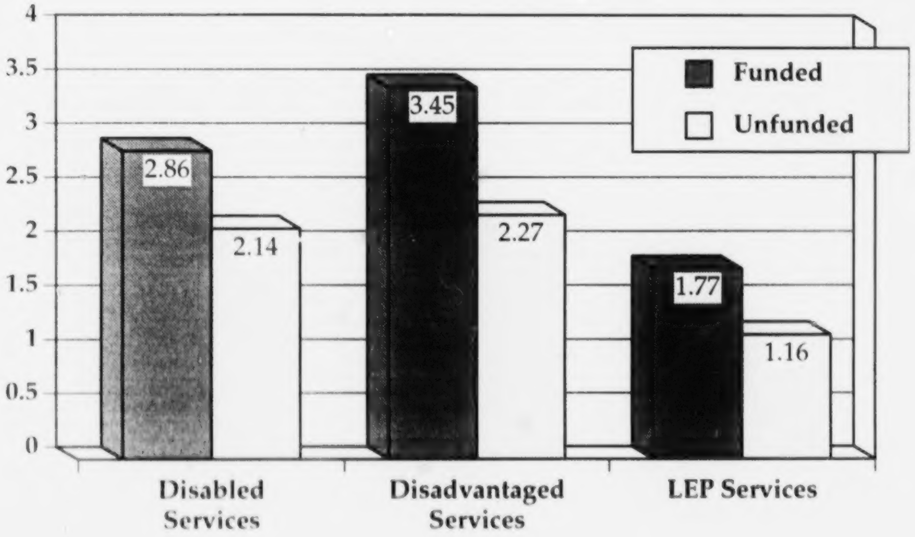
that funded institutions are **not** more likely to reduce services than are unfunded institutions—implying that the elimination of the set-aside funds did not lead to a reduction in services among postsecondary institutions. This is true even when institutions of the same size and with the same proportion of special population students are compared. In fact, institutions funded in both years increased services for disadvantaged students more than did institutions that were not funded in either year (see Figure 6.13 and Table 6.4), suggesting that Perkins funds are being used to increase the services offered to disadvantaged students.

Postsecondary institutions that received Perkins funds in 1991–92 were more likely than others to expand a wide range of services, including guidance services for disabled and disadvantaged students, the use of paraprofessionals and aides, job search activities for disadvantaged and LEP students, and assessment of LEP students. At the same time, these institutions maintained earlier levels of child care and curricula or equipment modification.

CASE STUDY FINDINGS ON LOCAL SERVICES

The case studies provide a rich source of information with which to verify survey data. Here we examine case study findings on the use of Perkins funds for special

Figure 6.13
Average Change in Special Population Services, 1990–91 to 1991–92, by Institution Funding Status[a]



[a]See endnote 14 for explanation of change measure.

Source: Omnibus Postsecondary Institution Survey

Table 6.4
Predicted Change in Special Population Services, 1990–91 to 1991–92, by Institution Funding Status

	Predicted Average Change [a]		
	Funded Both Years	Funded Neither Year	p-value
Disabled students	2.81	2.09	.10
Disadvantaged students	3.46	2.50	.02
LEP students	1.75	1.20	NS

[a] See endnote 14 for explanation of change measure. Predicted average change was calculated for institutions of average size and with average concentration of special population students.

Source: Omnibus Postsecondary Institution Survey populations, the effects of the elimination of set-asides, and some broader implications of Perkins provisions for special populations.

Use of Perkins Funds

The case studies found three main uses of Perkins funds: staff to provide counseling, assessment, and other assistance for special population students; the purchase of vocational equipment (primarily computers); and curriculum improvement efforts (primarily related to the integration of academic and vocational education). Of these, the use of funds for support staff predominated at most sites. With regard to these services, the case study researchers concluded that "the majority of site personnel were making good-faith efforts in beleaguered situations to provide the best services they could to the students most in need of them". [19]

The range of Perkins-funded supplemental services is often quite broad, typically including some combination of assessment staff/centers, job counselors, teacher aides and other paraprofessionals, tutors, and (at the postsecondary level) remedial education staff/centers. While it would be an exaggeration to say that all students' needs were met with Perkins funds, in most cases these funds appeared to make a real difference in the type and level of supplemental services offered.

Elimination of the Set-Asides

The case studies support the Omnibus Survey finding that the elimination of the set-asides has not resulted in a loss of services to special population students. Instead, the case study researchers concluded that "On the whole, the philosophy of special services for special populations has become part of district or institutional philosophy".[20] At virtually every site, vocational administrators reported that the elimination of the set-asides had either no effect or a positive effect on their vocational programs. Positive effects apparently resulted from increased flexibility. At a large urban west coast district, for example,

> The head administrator stated that schools have been serving special populations more effectively since the elimination of the set-asides. Specifically, he indicated that services to special populations are now more integrated in their approach to providing vocational education than they were previously.

At a rural western postsecondary institution:

> Although the current grant provides [less money than received under the previous set-asides] the director believed that the current monies are being spent more wisely. Instead of providing general assessment services which are already offered by the [larger

21-

> institution of which they are a part], current Perkins funds are targeted on the programs and students "that need it the most."

In the case study sites, the most common problem in using Perkins funds to serve special population students, in the view of local administrators, arises not from the elimination of set-asides, but from restrictions placed on fund-use decisions by state or regional agencies. For example, in an eastern state it was reported that

> Until this year (1991–92), Perkins funds have been . . . used for the pre-occupational programs that take place at the special populations center a half-hour's drive from the main [community college] campus; this depressed area has the greatest concentration of needy students. This year the state determined that Perkins funds [should] not be . . . used for the center's pre-occupational programs. Nor [could they] . . . be used for main-campus developmental programs. According to a system-wide federal programs administrator, "we could be forced to develop bogus remedial courses within departments to meet these requirements."

In a southern urban area, funds for a technical college are controlled through an intermediary consortium. The state and the consortium seem to have imposed restrictions on funds use that have limited local discretion and flexibility:

> [The administrators] said that the new funding requirements . . . make program improvements more difficult, that [the] use of funds is more restricted, and that it is harder to direct dollars and activities to special needs students because of required percentages.

There are no federal percentage requirements for the allocation of Perkins funds at the local level. These requirements, apparently emanating from the state and/or consortium, seem to be imposing set-asides similar to those that the Perkins Act eliminated.

Tension Between Serving Special Populations and Improving Programs

For many years, federal aid for vocational education has had the dual goals of serving special populations and improving programs. This duality has both reflected and generated tensions over the relative emphasis to be accorded each goal. The 1990 Perkins Act attempts to reduce this tension by emphasizing program improvement in sites or programs that have high concentrations of special population students. However, many vocational educators still think that too much emphasis is being placed on one goal — serving special populations. At a generally well-regarded midwestern AVS, for example, researchers found that although increased spending on disabled vocational students was viewed favorably,

> a caution was expressed that, in the long run, administrators do not want vocational education to be the place for special education students at the expense of providing rigorous training to other students wanting to master a vocation. They believe a significant emphasis on special needs students here hinders or cuts into a primary mission of vocational education — to prepare students for highly technical, competitive employment.

Similar concerns were reported in a state that has long emphasized using Perkins funds on special population students:

> Some teachers, especially vocational teachers, are not as enthusiastic [about the emphasis on serving special population students]. They indicated that this focus conflicts with other Department of Education emphases on "building a highly competitive working-class work force for the twentieth century." They believe that this goal suggests spending at least some vocational dollars on the most creative and innovative education strategies, whether or not such programs serve special needs students.

In the case study sites, teachers and administrators often mentioned their inability to serve the "average" student. This concern appears to be driving a strong interest in tech-prep programs, which are designed to serve the average student and often are seen by local educators as the "future salvation" of vocational education.[21]

On the other hand, advocates for special populations have been concerned that the elimination of set-asides in the 1990 Perkins Act would reduce opportunities and services for these students. As we have seen, this had not occurred as of 1992, but a more gradual, longer-term shift is still possible. As long as the Perkins Act is the main source of federal support for secondary-level supplemental services, this tension and debate are likely to continue.

Access Revisited

The Perkins Act requires that special population students be provided equal access to vocational education programs. Pursuant to this goal, the Act also requires state plans to provide assurances that local districts actively recruit special population students to vocational education.[22] However, active recruiting may also result in the over-inclusion of special population students — that is, the inappropriate placement of these students in vocational programs. In the face of declining enrollments, some programs are recruiting special population students to fill "empty seats." Moreover, the concentration of Perkins-funded services in vocational programs may unnecessarily restrict the educational options of special population students: if they want the services, there may be nowhere else to go. In these circumstances, factors other than the students' educational interests may be the primary determinants of placement.

The case studies provide numerous examples of active recruiting efforts. Some also raise concern that these efforts may unnecessarily restrict students' options. Consider this series of descriptions from a mid-size district in an eastern state:

> Because the area vocational school was intent on offsetting declining enrollments, their Perkins money was used to provide services to the increased number of special population students . . .
>
> [One AVS teacher said that] "some [feeder schools] used to send us their bad apples, but we've turned around— now we want the bad kids."
>
> There was also the case of a child whose mother was told her daughter had a learning disability [and] that the high school could not provide any assistance. That student is now enrolled at the vocational school.

We do not know how prevalent situations such as these are, but they are encountered frequently enough to raise concern that the Perkins emphasis on access, recruitment, and the concentration of services in vocational programs, as interpreted and implemented at the local level, does not necessarily work in the best interests of special population students.

CONCLUSION

State Roles and Responsibilities

At both secondary and postsecondary levels, equal access seems to be a major focus of states' Perkins reform efforts. States are as active in this area as they are in most other Perkins-related initiatives, suggesting that equal access is part of states' general Perkins-reform agenda.

Compliance with state equal access requirements and assurances appears to be high overall, although it is not universal. There is room for improvement. Additionally, although states report that their responsibilities concerning special populations have increased, these increases tend to be related to compliance with state participatory planning requirements and data collection responsibilities. States are less likely to assist localities in interpreting and implementing the equal access assurances. However, the relatively low level of state assistance to localities seems to be a more general problem, most likely related to state resources (cf. Chapter 3), than a problem of states' ignoring their equal access obligations.

State efforts are slightly more common at the secondary than at the postsecondary level, but this may be due more to the larger influence of state secondary agencies than to greater emphasis on equal access. Involvement also appears to be slightly greater for disabled student representatives than for disadvantaged and LEP student representatives, which may stem from the Act's focus on disabled students (specifically, Section 118's provisions on compliance with the Education of the Handicapped Act).

The data suggest one area of concern—adjustments to the state performance systems to account for special population student enrollments. States **are** moving to incorporate these modifications, but more states need to do so. Further, we do not know how valid states' adjustments are. Performance assessment systems are easily compromised, and pressure to compromise them will increase unless states ensure that localities serving high concentrations of special population students are fairly and appropriately evaluated.

Local Roles and Responsibilities

Supplemental Services. Guidance, counseling, and assessment services are almost universally offered at both secondary and postsecondary levels. Further, guidance services are more likely to be expanded in funded than in unfunded localities at both the secondary and postsecondary levels. This focus on guidance and assessment is consistent with provisions in the Perkins Act.

It is difficult to assess the value of guidance services, since these services can vary widely in quality depending on the number of counselors available, the counselors' training to deal with **vocational** special needs students, and the specific guidance and assessment programs used. The previous National Assessment found that these services are only tangentially related to improving student access to quality vocational programs, [23] a view reinforced by our Omnibus case studies.[24]

While the Perkins Act seems to view counseling as a valuable means of ensuring that special population students are made aware of vocational education opportunities and services, school observations consistently show that counselors rarely have the time or training to provide meaningful services. Furthermore, these services, even when available, do little to improve student access to quality vocational programs. In fact, guidance counselors seem to function more often as gatekeepers who channel special needs or other "problem" students into vocational education while keeping other students out.[25]

Moreover, given the Perkins Act's focus on targeting highly disadvantaged schools, it is questionable whether it makes more sense to devote limited federal resources within these schools to guidance and other non-instructional activities, rather than to program improvement activities. It does little good to "guide" students (or otherwise increase their access) to low-quality programs.

Perkins Effects. Perkins-funded school districts and postsecondary institutions offer more supplemental services for special population students than do unfunded districts and institutions. In the case study sites, a wide range of supplemental services are funded by the Perkins Act, and the main use of Perkins funds is typically to pay for staff to provide these services.

At the secondary level, 1990 Perkins funds appear to be used to maintain previously-funded services for disabled and educationally disadvantaged students, and to expand services for LEP students. The focus on LEP services might reflect an effort to focus on a group that had previously been given little attention, and whose size is growing rapidly.

At the postsecondary level, the emphasis appears to be on service maintenance and on expanding services for disadvantaged students. It is unclear what motivates this focus at the postsecondary level; it may be related to increasing vocational enrollments among disadvantaged students. However, LEP services do not show much expansion at the postsecondary level, suggesting a continuing access problem for these postsecondary students (see Chapter 5).

At both secondary and postsecondary levels, the elimination of the disabled and disadvantaged set-aside funds does not appear to have led to a reduction in services for special population students. Services have expanded in localities receiving Perkins funds, and the increase in services matches or exceeds that in localities that did not receive funds. Further, case study sites reported no detrimental effects from this change, and sometimes reported that it helped them better serve special population students by giving them more flexibility in using funds.

The Perkins Act provides many useful services for special population students. It also requires active recruiting efforts at the secondary level to bring such students into vocational education programs, where the services are located. Participation in these secondary programs is no doubt beneficial to many special population students, but it cannot be assumed to be beneficial to all, or even a majority. Chapter 15 shows that disabled students benefit in the labor market from secondary vocational education. Benefits to other students depend largely on their finding employment in training-related jobs. Evidence on whether disadvantaged or limited English proficient students improve their chances in the labor market by completing vocational courses is lacking, as is information on the effects of Perkins reforms on labor market outcomes. Policies with regard to special populations need to be more attentive to empirical evidence on the benefits they are likely to receive from participating in vocational education.

ENDNOTES

[1] In this chapter, "special population students" refers to students who are disabled, educationally or economically disadvantaged, or limited English proficient (LEP).

[2] Sec 111.

[3] Sec. 115.

[4] Ibid.

[5] Sections 115, 116, 117.

[6] Sec. 118.

[7] Ibid.

[8] See, for example, Sec. 118(a) (3) A-E; 118(a) (5) B; 118 (c) (1).

[9] The analyses in these sections include only those localities that enroll the students in question in their vocational education programs. For example, districts that do not enroll any LEP students in vocational education were excluded from all analyses examining services for LEP students.

[10] The data reported in this section are for regular districts only. Data are also available for vocational schools, but have not been analyzed.

[11] General Accounting Office (1993), *Vocational Education: Status in School Year 1990-91 and Early Signs of Change at Secondary Level* (GAO/HRD-93-71), Washington, DC: Author.

[12] Muraskin, L.D. (Ed.). (1993), *Secondary Vocational Education: Availability, Coursetaking, and Outcomes*, Washington, DC: Office of Policy and Planning, US Department of Education.

[13] For the regression analyses, disadvantaged students were defined as those grade 9-12 students who are eligible for the federal lunch program, or who are eligible for Chapter 1 (whichever number is larger). Also, services for educationally and economically disadvantaged students were merged. Disabled and LEP students include grade 9-12 students classified as such by their district.

[14] To measure change in the level of service provision, each service was coded "-1" if it had been reduced or eliminated, "+1" if it had been expanded, and "0" if it remained unchanged. Thus, a positive average across services implies a net expansion of services; a negative average implies a net reduction; and an average of zero implies that service expansions and reductions were balanced, or equally likely.

[15] For example, Section 113 of the Act requires assurances that the state "provide leadership, supervision, and resources for comprehensive career guidance, vocational counseling, and placement programs." Similarly, Section 118 requires that localities provide special needs students with guidance, transitional counseling, and assessment services. Guidance services are further emphasized in Section 235, which explicitly lists guidance and counseling as a

permissible use of Perkins funds, and in Section 240, which requires further assurances that counseling will be used to encourage students to take "coherent sequences of courses" and to assist special needs students. Finally, in the 1984 Perkins Act, guidance, counseling, and assessment were mandated services for all disabled and disadvantaged (including LEP) students.

16 Changes in ESEA Chapter 1 or Title VII would have had minimal impact on vocational students anyway, since very few secondary-level students receive these funds.

17 General Accounting Office (1993), *Vocational Education: Status in 2-Year Colleges in 1990-91 and Early signs of Change* (GAO/HRD-93-89), Washington, DC: Author.

18 For this regression analysis, disadvantaged students were defined as students receiving Pell Grants and/or Bureau of Indian Affairs assistance.

19 Milne, A., Martindale, M., & Michie, J. (1993, September), *Vocational Education in Communities*, Draft report prepared for the National Assessment of Vocational Education. Rockville, MD: Westat, p.66.

20 Ibid., p. 62.

21 Ibid.

22 Sections 118(b) and 118(c).

23 Muraskin, op. cit.

24 Milne, et al., op. cit.

25 Ibid.

CHAPTER 7

PROGRAMS FOR SEX EQUITY AND SINGLE PARENTS, SINGLE PREGNANT WOMEN, AND DISPLACED HOMEMAKERS

INTRODUCTION

In the 1970s, the Congress recognized the expanding role of women in the workforce. Congressional reports accompanying the 1976 Amendments to the Vocational Education Act noted that most women will work during at least some portion of their adult lives; that women constitute a large and growing part of the labor force; that most women work out of necessity; and that in spite of all this, working women are concentrated in a few lower paying occupational areas.[1] Further, many of the women entering the workforce out of economic necessity have little formal education and few job skills. [2]

To remedy this situation, the Congress included in the 1976 Amendments provisions to eliminate sex bias and sex stereotyping in vocational education, and (later) to serve displaced homemakers. Recipients' response to these provisions was initially very limited, prompting the Congress to strengthen and expand the provisions in subsequent legislation.[3]

Today, the 1990 Perkins Act mandates that each state set aside 10.5 percent of Perkins basic grant funds for two types of sex equity programs — programs to eliminate sex bias in vocational education and programs for single parents, single pregnant women, and displaced homemakers. In addition, each state must use up to $60,000 of its Perkins state administration monies to fund a state position for a vocational sex equity administrator. For the first time, the 1990 Act also requires that all sex equity funds be allocated within states through competitive grants, and includes single pregnant women in the pool of eligible recipients. These 10.5 percent reserve funds and programs are discussed in this chapter.

In Chapters 4 and 5, we examined one aspect of efforts to eliminate sex bias in vocational education — the enrollments of men and women in programs nontraditional for their gender. In this chapter, we focus on funding and services for programs to eliminate sex bias (hereafter referred to as sex equity programs) and for programs for single parents, single pregnant women, and displaced homemakers (hereafter referred to as single parent programs). We also examine the roles of states' sex equity administrators and their perceptions of the Perkins Act. Data on these issues are available from the Omnibus Surveys and from a survey of state vocational sex equity administrators conducted by the National Alliance for Partnerships in Equity.

We begin with an examination of program funding at the state level, then look at how funds are distributed within states. This section shows that funds have been greatly concentrated under the new Perkins Act, with larger grants going to a smaller number of recipients. It also reveals that single parent program funds are not targeted to poorer areas, in spite of a Perkins Act requirement for serving economically needy individuals.

We then review the nature and extent of sex equity and single parent services provided by regular school districts, area vocational schools, and postsecondary institutions, and compare the services provided by grant recipients and non-recipients. We find that funded districts and postsecondary institutions provide more services than those that are not funded, although we cannot say whether these programs are fully meeting students' needs.

Finally, we examine the roles and opinions of state sex equity administrators concerning the 1990 Perkins Act. These administrators are found to have appropriate levels of responsibility in most states, but their involvement in other state-level Perkins initiatives varies greatly across states. Administrators also have a generally positive view of the Perkins Act, including many of its most significant changes. Although they are not pleased with the elimination of the set-aside funds (from which they could presumably draw in the past), this change does not appear to have adversely affected the delivery of services to the students targeted by these programs.

FUNDING OF SEX EQUITY AND SINGLE PARENT PROGRAMS

Of the 10.5 percent of each state's basic grant reserved for sex equity and single parent programs, 3 percent must be allocated to sex equity and 7 percent to single parent programs. The remaining .5 percent is divided between these two programs at the state's discretion. In 1991–92, states allocated the .50 percent so that, on average, .35 percent was allocated to single parent programs, and .15 percent to sex equity programs.

States are also permitted to determine the division of sex equity and single parent funds between secondary and postsecondary education. These funds are more evenly split than Perkins local basic grant funds; in 1991–92, 60 percent of sex equity funds and 43 percent of single parent funds were allocated to secondary education.

Concentration of Funds

The previous National Assessment found that sex equity and single parent funds tended to be used for a wide range of activities and that grant sizes were typically very small, minimizing program impact.[4] The 1990 Perkins Act's mandate for funds allocation through competitive grants was one effort to increase the concentration of these funds, since the competitive process tends to disburse funds to a smaller number of recipients than does distribution by formula.[5]

Whether because of the competitive grant requirement or other factors, these funds have become more concentrated. From 1990–91 to 1991–92, sex equity and single parent funds were allocated to fewer sites with larger amounts of funding at each site. This concentration of funds was found for all recipients that we examined — regular districts, vocational districts, and two-year postsecondary institutions (see Table 7.1).

State policies can also act to increase grant sizes. For example, states can provide additional funds for sex equity and single parent programs or set minimum grant sizes. However, neither of these policies is widespread. Only 10 percent of state administrators of sex equity programs report additional state funding for these programs, as do 38 percent of single parent program administrators. Twenty-eight percent of all administrators report that their state has established minimum grant amounts. (The lowest reported minimum for sex equity programs is $3,000, and for single parent programs, $3,500.) Minimum grant amounts also seem to be helping to concentrate funds, although it is unlikely that they alone account for the relatively large concentration of funds between 1990–91 and 1991–92.

Targeting of Single Parent Funds

The Perkins Act also requires targeting of single parent funds. Section 113 of the Act calls for assurances that states "will emphasize assisting individuals with the greatest financial need" in using these funds. According to sex equity administrators, virtually all states meet this assurance by making it a requirement in program RFPs and/or using it as a criterion to evaluate RFPs. In most states it is left to the local provider to determine the specific method for targeting individuals with greatest financial need.

In spite of these efforts, single parent grants are no more likely to be awarded to localities that enroll high proportions of poor students than to those that enroll relatively few. For example, 17 percent of the regular school districts enrolling the highest proportions of poor students received a single parent grant in 1991–92, as did 15 percent of those enrolling the lowest proportions of poor students.[6] (For vocational districts the respective percentages are 24% and 24%, and for postsecondary institutions, 58% and 62%.) Administrators' reports suggest that the preferred method of targeting is to give priority to the poorest individuals within each funded site. This strategy of allocating funds regardless of poverty level but with poor individuals targeted within sites allows states to disperse funds broadly, a more politically palatable strategy. However, it is not consistent with the goals of the Perkins Act.

Table 7.1
Number (and Percent) of Eligible Recipients Receiving Sex Equity and Single Parent Grants, and Average Grant Size, 1990–91 and 1991–92

	Regular District	Vocational District	Two-Year Postsecondary Institution
Sex Equity Funds			
Number (and percent) receiving funds in:			
1990–91	1,949 (9)	87 (34)	482 (49)
1991–92	1,454 (6)	62 (24)	397 (40)
Mean grant size in:			
1990–91	$12,889	$24,533	$17,274
1991–92	$17,500	$33,446	$22,871
Median grant size in:			
1990–91	$5,000	$20,234	$10,562
1991–92	$13,000	$36,501	$14,997
Single Parent Funds			
Number (and percent) receiving funds in:			
1990–91	1,995 (9)	109 (43)	706 (71)
1991–92	1,772 (8)	85 (33)	593 (60)
Mean grant size in:			
1990–91	$19,426	$33,654	$41,402
1991–92	$26,895	$45,036	$47,183
Median grant size in:			
1990–91	$13,000	$34,929	$32,471
1991–92	$28,000	$36,196	$39,961

Source: Omnibus Surveys, Districts A, B, and Vocational, and Postsecondary Institutions

Although poorer localities are not more likely to receive single-parent grants, slightly **larger** grants are awarded to localities that enroll more poor students. At the secondary level, this occurs because bigger grants are awarded to both larger and poorer districts. However, at the postsecondary level, institutions with more poor students receive bigger grants only because they tend to be larger institutions; postsecondary institutions of comparable size receive grants of the same size, regardless of the number of poor students they enroll.[7] This is in marked contrast to the findings for basic grant allocations; postsecondary institutions' basic grant awards vary in size depending on the number of special population students enrolled (see Chapter 2).

Thus, targeting of single-parent funds to sites that serve the highest concentrations of poor students is weak (at the secondary level) or nonexistent (at the postsecondary level). Targeting of funds to needy individuals within grant sites may be stronger (as RFP criteria seem to focus on this), but is a less effective means of reaching poor individuals in general.

Allocations Among Types of Institutions

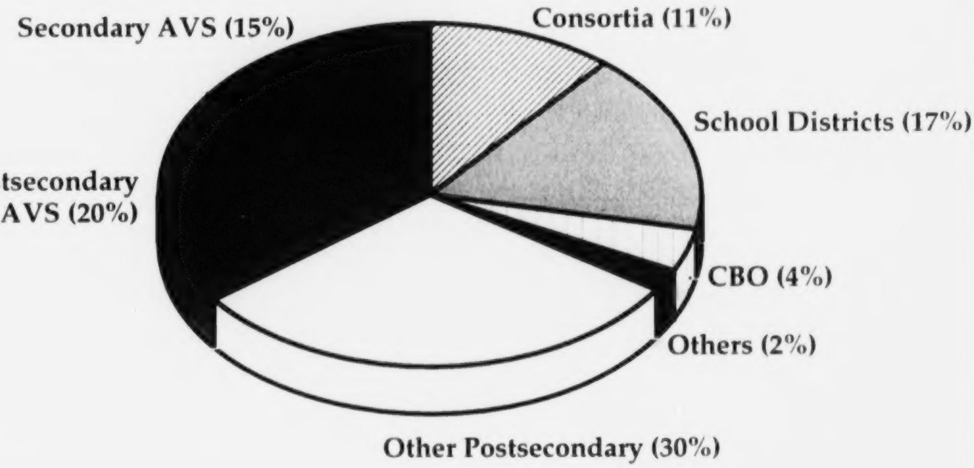
What types of institutions receive sex equity and single parent grants? Area vocational schools (AVSs) and postsecondary institutions are the largest recipients of sex equity and single parent funds, as shown in Figure 7.1 and Table 7.2. [8] Each received about one-third of each pool of money. In contrast, regular school districts (individually or in consortia) received 19 percent of single parent funds and 28 percent of sex equity funds, and community-based organizations (CBOs) received less than one-fifth of each pool of funds.

Area vocational schools also received large proportions of funds relative to their share of vocational enrollments, while regular school districts and postsecondary institutions received relatively small proportions of funds. For example, secondary AVSs include about 20 percent of secondary vocational students, but received 35 percent of sex equity funds and 39 percent of single parent funds awarded to secondary institutions (32% and 28% if CBOs are included). More remarkably, area vocational schools serving primarily postsecondary students include fewer than 10 percent of postsecondary vocational enrollments, yet they received 40 percent of sex equity funds and 45 percent of single parent funds awarded to postsecondary institutions (37% of each if CBOs are included).

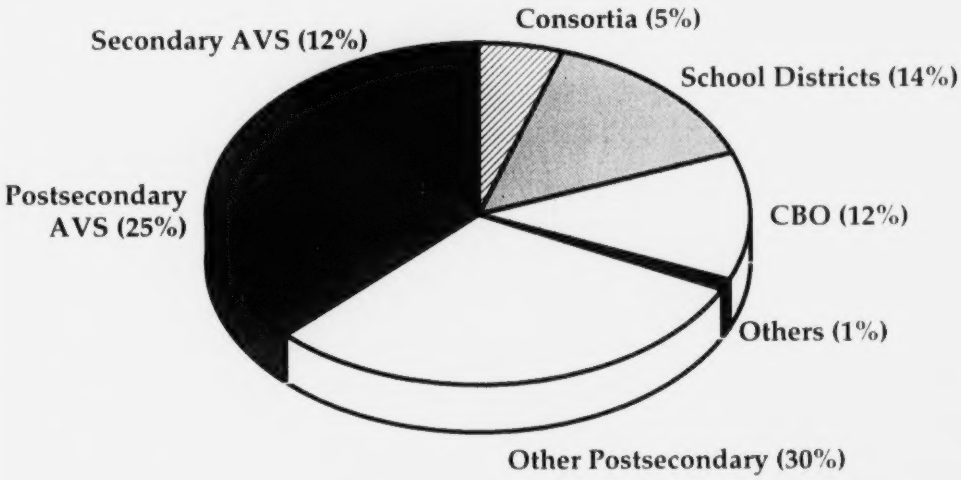
Why area vocational schools are such preferred recipients is unclear; state eligibility rules are an obvious factor, but others may be operating as well. One possibility is that states choose to target funds to AVSs because these institutions have high concentrations of vocational students and extensive vocational equipment and facilities. The previous National Assessment found, for example, that AVSs were often preferred sites for establishing centers for displaced homemakers. [9] Another possibility, supported by other findings in this report, is

Figure 7.1
Average Percent of Sex Equity Funds and Single Parent Funds Awarded to Eligible Recipients, 1991–92

Sex Equity Funds



Single Parent Funds



Source: National Alliance State Sex Equity Administrator Survey

Table 7.2
Local Distribution of Sex Equity and Single Parent Awards

Level and Type of Recipient	Sex Equity Programs		Single Parent Programs	
	Average Percent of Funds Awarded to Recipient	Percent (and Number) of Awards to Recipient	Average Percent of Funds Awarded to Recipient	Percent (and Number) of Awards to Recipient
Secondary recipients				
Individual school districts	17	22 (226)	14	21 (335)
Consortia of districts and other institutions	11	11 (110)	5	9 (144)
Secondary AVSs	15	17 (169)	12	17 (263)
Total	43	50 (505)	31	47 (742)
Postsecondary recipients				
Postsecondary AVSs	20	14 (141)	25	18 (280)
Other postsecondary institutions	30	30 (305)	30	26 (406)
Total	50	44 (446)	55	44 (686)
Other recipients				
Community-based organizations	4	4 (39)	12	7 (112)
Other	2	1 (15)	1	2 (27)
Total	6	5 (54)	13	9 (139)

Source: National Alliance State Sex Equity Administrator Survey

that AVSs are better "tuned into" the Perkins Act — they may be more interested in and thus better able to attract Perkins funds than are other institutions.

State eligibility rules and procedures clearly contribute to the small percentage of funds awarded to CBOs. Previous research demonstrated an undue exclusion of these organizations from the grant process in some states.[10] As a result, the 1990 Perkins Act added language to strengthen CBOs' role in this process, a strategy that appears to have been less than fully successful. In 1991–92, most administrators reported that CBOs were directly or indirectly eligible for funding in their state. However, some of these administrators did not include CBOs in their RFP distribution lists; as a result, CBOs were still excluded from 28 percent of all RFP lists. This exclusion necessarily limits the extent to which variety and competition are fostered in the grant process.

State-Sponsored In-Service Training. The small proportion of regular school districts that receive sex equity and single parent grants, and the small proportion of funds allocated to these districts suggest that regular districts receive little from the Perkins sex equity effort. This is somewhat misleading, however, as sex equity and single parent funds are also used for state-level activities.

In fact, sex equity efforts appear to be a high state priority, and a relatively large proportion of regular districts benefit from this state effort. The Omnibus Surveys show, for example, that in 1991–92, 24 percent of regular school districts received in-service training on the elimination of sex bias in vocational education. This is a high level of in-service offering, comparable to that concerning other Perkins initiatives, such as tech-prep and the integration of academic and vocational programs.

ACTIVITIES AND SERVICES AT THE LOCAL LEVEL

The Perkins 10.5 percent reserve funds are used primarily by localities to provide activities and services for nontraditional students, single parents, single pregnant women, and displaced homemakers. In this section, we examine the extent to which localities offer these services, the types of services most frequently offered, and the extent to which Perkins funding increases service availability. The latter is examined through a comparison of the number of services provided in funded versus unfunded localities.

Sex Equity Activities and Services

Overall, almost half of all regular districts (47%) do **not** engage in any activities to reduce sex bias. Twenty-two percent of AVSs and only 5 percent of postsecondary institutions do not offer any sex equity activities.[11] Among those that do offer activities or services, the average number offered also differs by institution type. Districts offer the fewest services, AVSs offer an intermediate number, and postsecondary institutions offer the most (30%, 50%, and 58% of listed services offered).

These differences may reflect the likelihood that each type of locality receives Perkins sex equity funds. A higher proportion of vocational districts and postsecondary institutions receive these funds than do regular school districts, and (as we will see) localities that receive funds are more likely to provide services than are localities that do not.

The extent to which specific, individual sex equity services and activities are offered reflects the overall pattern, with each activity being more prevalent in

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AVSs and postsecondary institutions than in regular school districts (see Figure 7.2). In spite of this difference, the three institutions are remarkably similar in the types of services they provide. The most commonly provided services are counseling in nontraditional fields, active recruitment of students to nontraditional fields, and providing students with opportunities to meet nontraditional workers. The least commonly provided services are those that involve more costly and extensive changes — curriculum development or modification and programs designed for nontraditional students — as well as hiring or placement of faculty in nontraditional fields (which is limited by faculty vacancy rates).

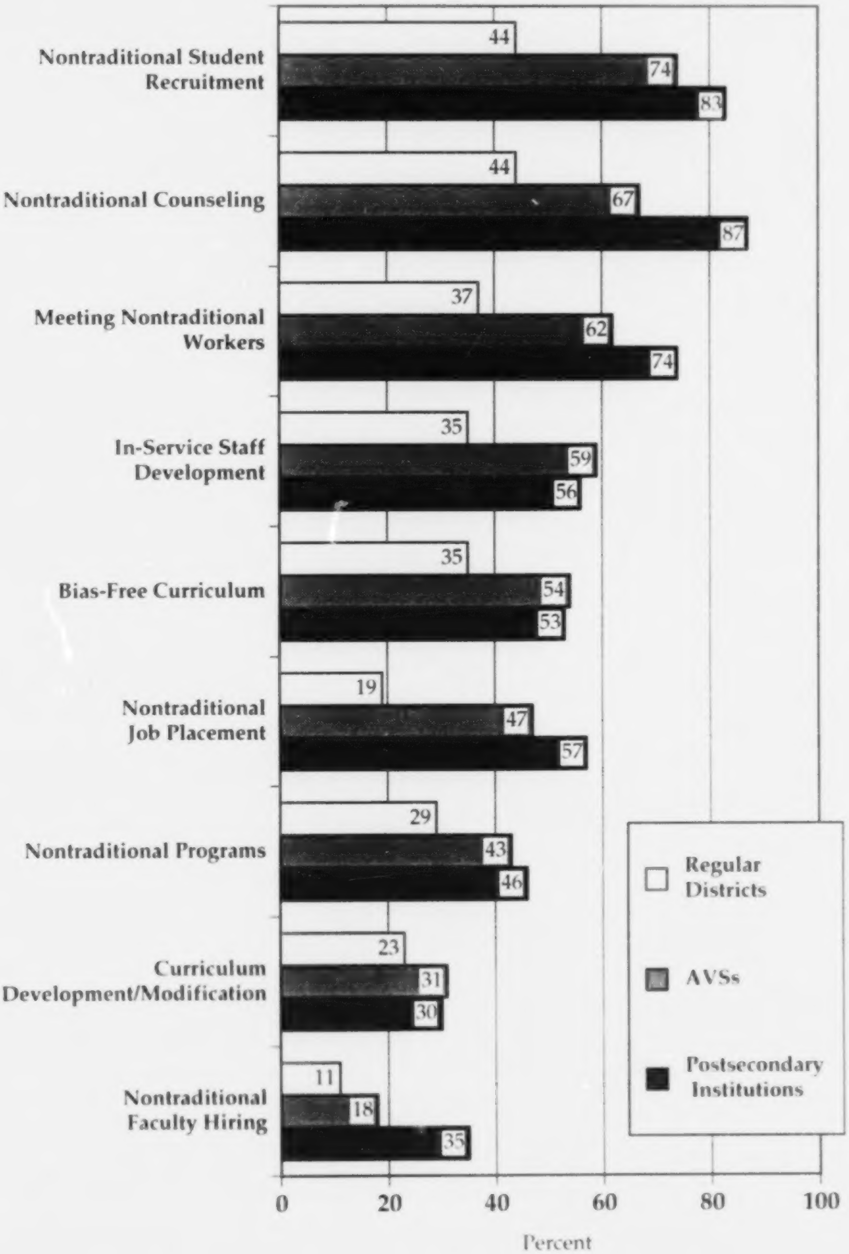
It is difficult to judge the effectiveness of these services. Some of our case studies suggest that modest changes can make a small, but important difference. In one district, for example, a new student recruitment policy that required prospective area vocational school students to tour all program facilities rather than just those in which they were initially interested, seemed to broaden students' enrollment choices. Studies of nontraditional vocational students and their classes also point to the importance of increasing instructors' awareness of sex equity issues. [12] These types of changes are relatively inexpensive, but require an institutional commitment to sex equity. More comprehensive efforts may also be needed to ensure that students complete nontraditional programs; teachers and administrators in our case studies identified attrition among nontraditional students as a continuing problem.

Single Parent, Single Pregnant Woman, and Displaced Homemaker Activities and Services

Vocational programs appear to serve large numbers of single parents, single pregnant women, and displaced homemakers, particularly at the postsecondary level. Approximately 101,000 single parents, single pregnant women, and displaced homemakers are enrolled in vocational education programs at the secondary level (according to Omnibus Survey data). Almost half of regular school districts (43%) enroll these individuals in vocational programs, as do 78 percent of secondary AVSs. The total number of postsecondary students in these categories is unknown, but approximately 369,000 postsecondary vocational students are unmarried and have dependents. [13] Further, virtually all public two-year institutions (96%) enroll single parents, single pregnant women, and displaced homemakers.

As is true for sex equity services, postsecondary institutions are the most likely to provide services for single parents, single pregnant women, and displaced homemakers, followed by area vocational schools, then regular districts (68%, 53%, and 41% of listed services offered; see also Figure 7.3).[14] One reason postsecondary institutions may be more likely to provide these services is that the targeted populations are more prevalent at this level, thereby increasing the

Figure 7.2
Percent of Localities That Offered Each Sex Equity Service or Activity in 1991–92



Source: Omnibus Surveys, District A, Secondary School, and Postsecondary Institution

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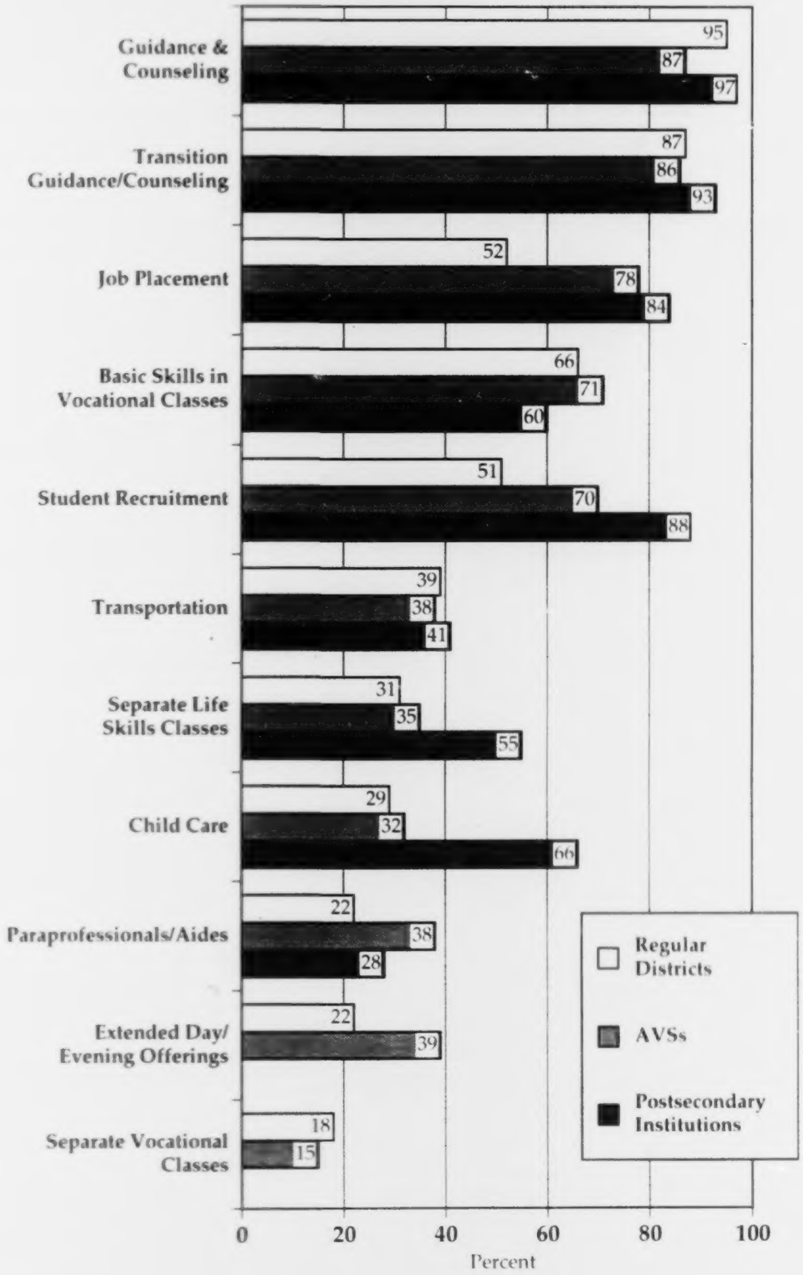
Figure 7.3
Percent of Localities Enrolling Single Parents, Single Pregnant Women, or Displaced Homemakers That Offered Each Service in 1991–92



Source: Omnibus Surveys, District A, Secondary School, and Postsecondary Institution need for services and making service provision more feasible. (For example, it is easier to justify child care services for 40 single parents than for five.)

The pattern of services offered is fairly consistent, with guidance and counseling services being most frequently offered by all types of institutions. Job placement services and basic skills classes are also common. Postsecondary institutions place more emphasis than do secondary districts or AVSs on student recruitment, separate life skills classes, and child care services.

Again, it is difficult to judge the effectiveness of these efforts. Targeted counseling (for building self-confidence, assertiveness, parenting skills, and career planning) appears crucial and is a common element in programs for these students.[15] Outreach and recruitment efforts are particularly critical at the postsecondary level to reach individuals who are no longer in school, and child care services (or referral to these services) are of obvious importance. However, there appears to be some ambivalence about the focus on vocational training for these students. One recent study of teen parent programs noted:

> School staff everywhere strongly support the goal of economic self-sufficiency for teen mothers. But they are often reluctant to actively advocate vocational education as a means of achieving self-sufficiency for fear that teen mothers will come to believe that they are incapable of more academic pursuits.[16]

This concern is heightened by the fact that many traditionally female vocations are low paying (e.g., secretarial and clerical positions, health aides, food and other personal service positions). To avoid this dilemma, some programs for single parents, single pregnant women, and displaced homemakers focus on nontraditional occupations or on entrepreneurial skills. But encouraging these students to be "trailblazers" raises other concerns about placing them in situations where they are likely to face further hurdles and obstacles, in addition to the barriers they face in their role as single mothers, widows, or divorcees.

Guidance and Counseling Services. The nearly ubiquitous availability of guidance and counseling services for nontraditional students and for single parents, single pregnant women, and displaced homemakers again points out the limitation of survey data on this issue. It is our experience that, except where Perkins funds are available, few counselors are actually trained to deal specifically with the vocational needs of these students, and few targeted guidance programs exist for them. Many respondents are clearly assuming that the availability of any guidance or counseling constitutes a specific service for these special-needs students.

In contrast, information on effective single parent programs suggests that intensive, specialized guidance is one of the key features of these programs;

standard guidance services are not enough. The data in this section thus should be viewed as overestimating the extent to which guidance and counseling services are appropriately provided.

EFFECTS OF PERKINS FUNDING ON SERVICE AVAILABILITY

It is precisely because sex equity and single parent services are so seldom available that the Perkins Act provides funds for these services. In this section, we examine the extent to which Perkins sex equity and single parent funding is associated with service provision: Are services more likely to be offered in districts or postsecondary institutions that receive funds than in those that do not?[17]

Services and Funding Status

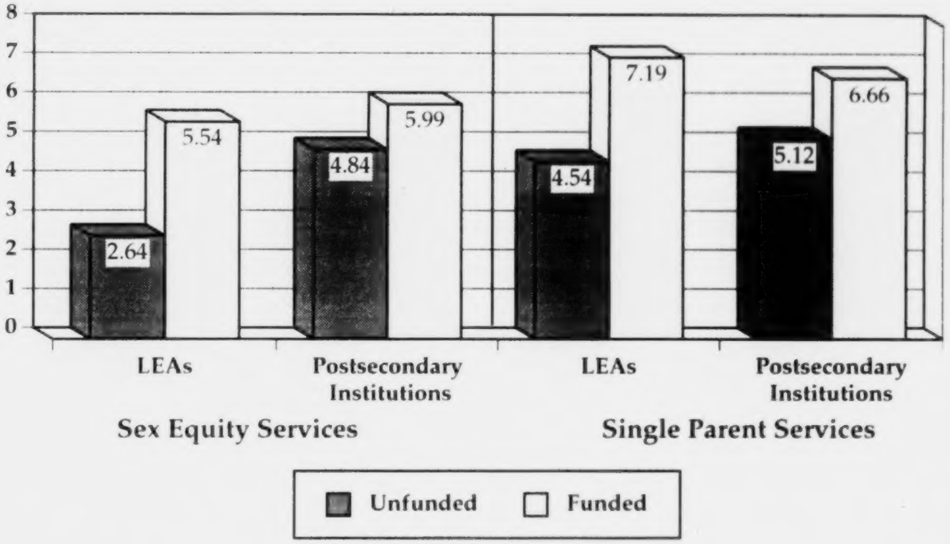
Figure 7.4 shows the average number of sex equity services offered by regular school districts and postsecondary institutions that did and did not receive sex equity funds in 1991–92.[18] As expected, funded districts and postsecondary institutions offer more services than their unfunded counterparts. Since most localities that received sex equity funds in 1991–92 also had these funds in 1990–91, this higher level of service provision is best viewed as resulting from multiyear funding, rather than from 1991–92 funding alone.[19]

The effects of funding appear to be particularly large at the secondary level. On average, funded postsecondary institutions offer 1.25 times as many sex equity services as unfunded postsecondary institutions, while funded districts offer twice as many services as unfunded districts.

Figure 7.4 shows a similar pattern of findings for single parent services. Funded districts offer 1.5 times as many services as unfunded districts. Postsecondary institutions show a slightly smaller (but still statistically significant) effect, with funded institutions offering almost 1.33 times as many services as unfunded institutions. Again, these findings should be viewed as reflecting the effects of multiyear rather than single-year funding.

The higher level of sex equity and single parent services among funded localities does not prove that Perkins funding increases the likelihood that services are offered, since localities that already offer more services could be more likely to receive grant funds. However, given the supplemental nature of these services and the size of the observed differences, it seems unlikely that pre-existing service differences account for these findings. In addition, because localities tend to count any guidance and counseling activity as a special sex equity or single parent service, these findings understate the greater availability of services in funded sites.

Figure 7.4
Average Number of Sex Equity and Single Parent Services Offered, By Institution Type and Funding Status, 1991–92



NOTE: All averages are for 9 listed services, except for secondary single parent averages, which are based on 11 listed services.

Source: Omnibus Surveys, Secondary District A and Postsecondary Institution

It is also worth noting that although school districts offer fewer sex equity and single parent services than postsecondary institutions, when one compares **funded** districts and institutions the levels of service availability are about the same. The different levels of service provision that exist between all districts and postsecondary institutions arise both because a smaller proportion of districts than of postsecondary institutions receive Perkins sex equity and single parent funds, and because **unfunded** postsecondary institutions offer more sex equity and single parent services than do unfunded districts.

Finally, the greater increase in service provision among funded districts compared to funded postsecondary institutions is quite striking, and does not appear to be due to larger grants. Both overall grant size and grant size on a per pupil basis are larger for postsecondary institutions than for regular districts. (Secondary grants could be larger on a per-targeted-student basis, although this seems unlikely). However, this difference in **level** of service provision could be misleading, as postsecondary institutions may concentrate their funds on fewer (and sometimes more costly) services, such as more extensive counseling and guidance efforts, separate classes, and child care services.

THE STATE VOCATIONAL SEX EQUITY ADMINISTRATOR

The 1990 Perkins Act, like its predecessors, provides funds for each state (defined as the 50 states and the District of Columbia) to employ a full-time state vocational sex equity administrator, whose main responsibility is administering the Perkins 10.5 percent reserve funds. As of Spring 1992, all 50 states, the District of Columbia, **and** Guam and Puerto Rico had established a "state" sex equity administrator position.

Furthermore, at least 13 states and territories employ a second administrator to help manage these funds. These include two of the most populous states, Texas and California, as well as 10 other states and Guam. The typical pattern in two-administrator states is for each administrator to manage both sex equity and single parent funds, but for one to manage these funds at the secondary level and the other at the postsecondary level.

In this section, we examine the extent to which these administrators are fulfilling their roles, including those responsibilities explicitly mandated by the Perkins Act and others suggested by the Act's overarching concern with equity and program quality. We also examine administrators' views on the effects of the Perkins Act on state and local efforts.[20]

Sex Equity Administrators' Responsibilities

Section 111 of the 1990 Perkins Act lists 12 responsibilities for the state sex equity administrator. These can be grouped into four general categories: (a) manage the 10.5 percent reserve programs and funds; (b) assess the extent to which the needs of women and nontraditional students are being met; (c) provide assistance to local recipients; and (d) develop recommendations for outreach programs.

Most of these responsibilities are carried over from the 1984 Perkins Act. However, the 1990 Act expands the specific responsibilities involved in managing the 10.5 percent reserve funds and in conducting needs assessments, including activities such as developing an annual plan, and analyzing and disseminating data on local programs. These responsibilities were added, at least partially, to ensure that administrators are given the authority Congress intends them to have. Historically, some administrators have been hindered by a lack of support from their state vocational education agency. [21] We found that in a few states, resistance to sex equity efforts apparently still exists, although most states appear to be supportive.

For example, most administrators feel they have been given full responsibility for the funds they manage, although about 10 percent feel they have only partial responsibility for these funds. Also, about three-quarters (74%) feel that other administrators in their state are accepting and supportive of their activities, while 15 percent feel these other administrators are unaccepting and nonsupportive. In the few states where administrators do not appear to have the authority or responsibility that the Perkins Act demands, a network of "good old boys" is typically (perceived to be) operating.

A second issue is the broader question of the extent to which administrators fulfill their various responsibilities, and how their roles and activities are evolving. On average, administrators feel that their level of responsibility and activity has increased under the new Perkins Act, although the particular responsibilities that are new to the 1990 Act did not increase more than others. Presumably, administrators were already involved in these activities before the 1990 Act went into effect.

While most administrators view their increased responsibilities as a sign of increased authority and input, some noted difficulties created by heavier workloads and reduced state staffing, by having less time to work directly with local programs, or by feeling that their work has expanded beyond what one person can accomplish. The administrators report, on average, that they do not have enough time for their Perkins responsibilities, particularly for those that involve interacting with or collecting data on local programs (see Appendix Table A-7.3).[22]

The one Perkins-mandated responsibility that administrators seem to have the most difficulty fulfilling is the review of proposed actions on grants, contracts, and state board policies. Almost one in five administrators (18%) reported that they did not conduct this activity in either 1990–91 or 1991–92, and administrators rank this as one of the activities for which they have the least time. The review of state board policies is particularly infrequent: Over half (58%) report that they have little or no input into the review of these policies, with almost one-third (31%) reporting that they have no input. The Perkins Act may need to be more precise about specifically what types of policies and other actions should be reviewed by these individuals.

Cooperation With Consumer and Homemaking Education. The 1990 Perkins Act also requires that the person in charge of consumer and homemaking education cooperate with the state sex equity administrator to eliminate sex bias and stereotyping in vocational education. In most cases, there is some level of cooperation between these individuals, although it is usually sporadic. Only 34 percent of sex equity administrators report interacting with consumer and homemaking officials on a regular basis, while the majority (54%) interact on an occasional basis. Eleven percent report that they have no interactions with these individuals.

Role in State Performance Standards. The Perkins Act also requires that the state sex equity administrator be consulted in the process of selecting the Committee of Practitioners, the group that establishes the Perkins-mandated system of performance standards and measures. We did not ask specifically about this input, which is relatively minor, but focused instead on the degree to which sex equity administrators are consulted in the development of the state performance measurement system.

The picture is quite mixed. While 43 percent of administrators report playing a moderate or major role in the development of these systems, 34 percent play a minor role, and 23 percent have no role. However, the inclusion of sex equity issues in the design of the performance measurement system appears to be fairly common. In Spring 1992, when administrators were surveyed, many states were still in the early stages of developing their performance measurement system. As a result, only 58 percent of the administrators knew whether this system would address sex equity issues. But of those who could judge, most (87%) reported that the system did or would have some provision for sex equity issues.

Role in Tech-Prep Initiatives. Among the major new initiatives in the 1990 Perkins Act are tech-prep programs. It is important that female students have equal access to these innovative programs, implying a role for administrators to ensure that sex equity issues are addressed as these programs are developed.

Administrators' involvement in these initiatives is uneven. Where state-level tech-prep activities exist, about one-third of sex equity administrators (34%) have no role in these activities. Only 30 percent play a moderate or major role; equally often, their role is minor (36%). This is a slightly lower level of involvement than exists for the state system of performance standards and measures.

In addition to involving the sex equity administrator in tech-prep activities, states can also encourage sex equity in tech-prep programs by requiring that the issue be addressed in RFPs. About 60 percent of states include at least one of three sex equity provisions in tech-prep RFPs: a requirement for addressing sex equity issues, priority placed on sex equity issues, or required monitoring of the participation of females. Forty percent of states do not include any of these provisions.

The sex equity administrator's involvement in state tech-prep activities is clearly related to the inclusion of these provisions in tech-prep RFPs. In 15 states where the administrator is not involved in tech-prep initiatives, only two states' RFPs include any of these equity provisions; in 13 states where the administrator has a moderate or major role, 12 states include at least one of these provisions. We cannot discern the direction of causality; it could be that the administrators' input leads to the inclusion of these equity provisions, but it is also possible that states that are more attuned to sex equity issues independently seek these administrators' input **and** include sex equity provisions in their tech-prep RFPs.

Interestingly, states that give sex equity administrators a larger role in developing performance standards and measures are not more likely to give them a larger role in developing tech-prep initiatives. As a result, only very few administrators — 9 of 50, or 18 percent — play at least a moderate role in both Perkins initiatives.

PERCEIVED EFFECTS OF THE 1990 PERKINS ACT

In this section, we review state sex equity administrators' opinions on the effects of changes in the 1990 Perkins Act on the administration and implementation of their programs, and on the overall effects of the new Act on state and local initiatives.

The State Vocational Sex Equity Administrator Survey asked these administrators for their initial impressions of the Act's effects as of Spring 1992. However, since this was early in the implementation of the 1990 Perkins Act, these questions were asked again in Spring 1993, at the annual meeting of the National Alliance for Partnerships in Equity. The second wave data include a smaller number of administrators (about 30), since not all administrators attended the session in which the survey was conducted. Although it does not appear that the smaller 1993 sample is biased, we cannot fully assess this; therefore, the 1993 findings should be considered tentative.

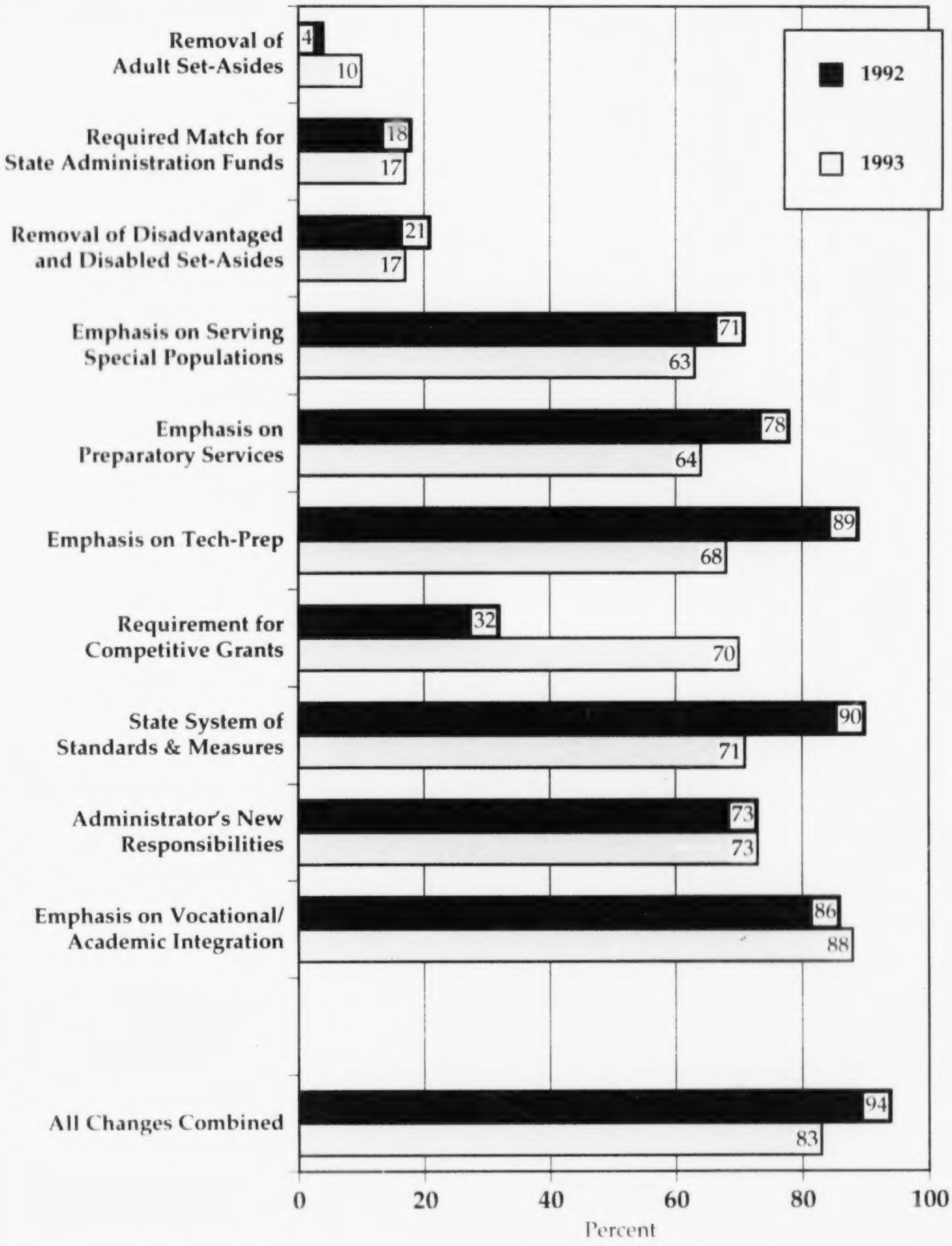
Effects of 1990 Perkins Act Provisions

The Perkins Act contains a number of new or modified provisions designed to improve the administration and implementation of the 10.5 percent reserve programs, as well as to improve vocational education in general. Administrators viewed most of these changes positively in terms of their effects on sex equity and single parent programs, and their views remained positive two years after Perkins implementation, though somewhat less so (see Figure 7.5; full data are in Appendix Table A-7.4).

The only Perkins Act changes administrators viewed as having negative effects, on average, are those that in some way restrict the amount of funding available for the 10.5 percent reserve programs. For example, the removal of the adult, disadvantaged, and disabled set-aside funds was viewed negatively by about 40–50 percent of the administrators. The required state match for Perkins state administration funds is also viewed as having negative effects, although about half thought this requirement had no effect on their programs. Opinions on the effects of these provisions did not change much from Spring 1992 to Spring 1993.

In contrast, administrators' view of the Perkins Act requirement that the 10.5 percent reserve funds be allocated via competitive grants changed dramatically over time. In Spring 1992, only one-third saw this requirement as having a positive effect. At that time, they expressed concerns with the short timeframes for conducting grant competitions, the lack of administrator discretion in the competitive process, and the uncertainty of continued funding for individual programs. However, a year later 70 percent of administrators saw the

Figure 7.5
Percent of Administrators Rating Provisions of the 1990 Perkins Act as Having Had a Positive Effect on Their Programs, Spring 1992 and Spring 1993



Source: National Alliance State Sex Equity Administrator Survey and Follow-up

competitive process as having a positive effect. The ability of the competitive process to target funds to sites with higher quality programs seems to eventually compensate for other shortcomings.

Other important Perkins Act changes include the increased emphasis on preparatory services, serving special populations, vocational-academic integration, tech prep, and the state system of performance standards and measures. All of these changes are viewed as overwhelmingly positive, although some of the initial positive response seems to be a result of high expectations that wore off somewhat over time. For example, while initially about 90 percent of administrators viewed tech prep and performance standards favorably, only about 70 percent viewed these initiatives favorably by Spring 1993 — still a majority, but not nearly as strong a majority. By Spring 1993, integration had the most favorable rating of all the new Perkins provisions, with 88 percent of administrators viewing vocational-academic integration as having positive effects.[23]

Effects of the Perkins Act on Programs and Services

State sex equity administrators also think the 1990 Perkins Act has improved state program administration, local programs and services, and the ability to meet students' needs (see Figure 7.6; full data in Appendix Table A-7.5).

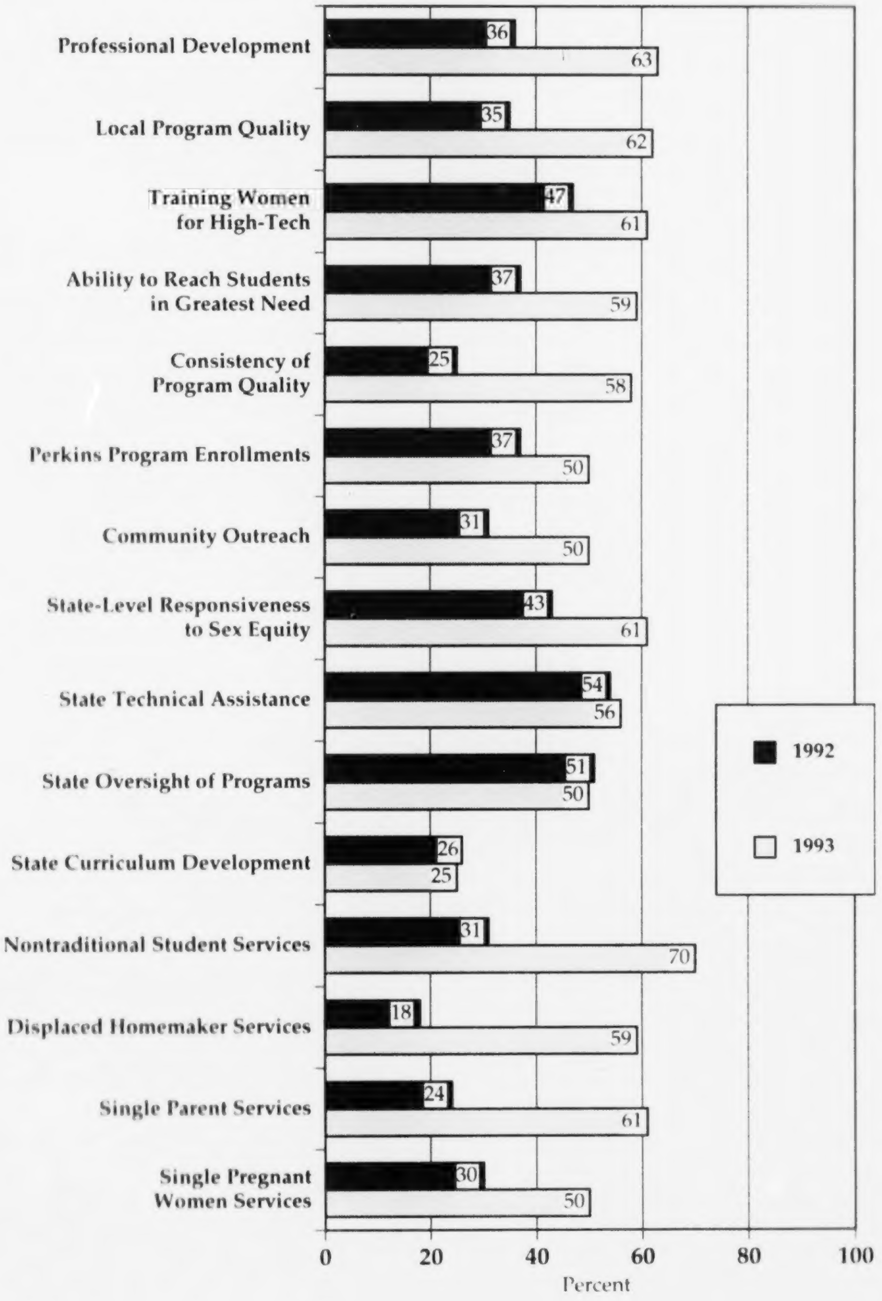
After one year of Perkins implementation, most administrators reported no noticeable effects on state and local efforts. However, even at that point, the average response was that state sex equity efforts, local programs and services, and the ability to meet students' needs had increased under the new Act.

A year later, administrators' impressions of the Perkins Act's effects had become clearer and stronger, sometimes dramatically. By Spring 1993, a majority felt that the Perkins Act had increased or improved virtually all state and local efforts. For example, in 1992 only 35 percent of administrators thought that the "overall level of program quality" had improved as a result of Perkins, but by 1993, 62 percent thought so. The largest increases were in "the provision of services most needed" by students. In 1993, 50–70 percent of administrators felt that the Perkins Act had improved the provision of these services, compared to only 18–30 percent in 1992.

The positive perceptions of the Perkins Act's effects on local program efforts and features (i.e., the provision of needed services, program enrollments, and program quality) are especially encouraging, as the Perkins Act included changes that dealt only indirectly with these issues.

It is especially interesting that the ability to reach students in need and to provide relevant student services has not declined; this suggests that elimination of the disadvantaged, disabled, and adult set-asides has not had a negative impact on

Figure 7.6
Percent of Administrators Rating the 1990 Perkins Act as Increasing Each Program Feature, Spring 1992 and Spring 1993



Source: National Alliance State Sex Equity Administrator Survey and Follow-up

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these programs (or that any negative impact it did have was counterbalanced by other factors). We saw earlier (in Chapter 6) that this also seems to be true for services and programs supported with local basic grant funds.

CONCLUSION

Funding. Under the new Perkins Act, sex equity and single parent grants have become more concentrated — fewer sites receive grant awards, but the awards made are larger than they were under the previous Perkins Act. This shift is most likely attributable to the Perkins requirement for allocating sex equity and single parent funds through a competitive process; few states have other requirements or criteria that would concentrate funds.

The Perkins Act requires that states give priority to "individuals with the greatest financial need" when allocating single parent funds. Most states address this mandate by using criteria intended to target service provision to individuals with greatest need within a funded site, rather than targeting funds to sites that are the most economically disadvantaged. As a result, districts and postsecondary institutions that serve high concentrations of economically disadvantaged students are no more likely to receive single parent grants than are those that serve low concentrations of these students. This funding pattern does not appear to be consistent with the intent of the 1990 Perkins Act.

Local Sex Equity Services. While only 5 percent of public two-year postsecondary institutions offer no sex equity programs or services, 22 percent of AVSs and almost 50 percent of regular school districts offer no sex equity programs or services. Among those that do offer services, the types of services offered are similar across providers: Recruitment and counseling services are the most common, and curriculum development and faculty hiring are the least common.

The different availability of services among providers partially reflects their different likelihoods of receiving Perkins sex equity funds. Forty percent of postsecondary institutions received these funds in 1991–92, as did 24 percent of AVSs and only 6 percent of regular districts; funded providers (districts and postsecondary institutions) offer more services than those without funds. This funding effect appears to be larger at the secondary level than at the postsecondary level, possibly because postsecondary institutions concentrate their funds on fewer services.

Local Single Parent Services. Most providers that enroll single parents, single pregnant women, or displaced homemakers in their vocational programs offer at least some services for these students. Across providers, counseling and job placement are the most common services, and child care, extended offerings, and separate vocational classes are least common. However, we question whether appropriate, targeted counseling is as available as these data suggest.

Again, the greater availability of single parent services among postsecondary institutions, followed by AVSs and then regular districts, partially reflects their different likelihoods of receiving Perkins sex equity funds — 60 percent of postsecondary institutions received these funds in 1991–92, as did 33 percent of AVSs and only 8 percent of regular districts, and funded providers were more likely to offer services. These services may also be more common at the postsecondary level because postsecondary institutions enroll larger numbers of single parents, single pregnant women, and displaced homemakers (as a group), creating a greater need for services.

As is true for sex equity services, the effect of funding on service availability appears to be larger at the secondary level than at the postsecondary level; in this case, it is clearer that this results from postsecondary institutions focusing on a few, more costly services such as child care, recruitment, and separate classes.

State Administrators. State sex equity administrators seem to have appropriate levels of authority in most states, although a few states appear to still be resistant to these individuals and their programs. Most sex equity administrators interact with their states' consumer and homemaking education official, as required by the Perkins Act, although about one-tenth do not. Sex equity administrators' role in other Perkins initiatives varies; most are at least somewhat involved with state performance standards and tech-prep initiatives, but one-quarter are not involved in performance standards and one-third are not involved in tech prep. Only a small minority have significant involvement in both initiatives. State administrators also seem to have only limited involvement in the review of state board policies and other state actions. However, this may result more from a lack of time or legislative clarity than from a lack of authority.

In general, there does appear to be a growing tension between the increased authority and responsibilities given these administrators and the amount of time they have to fulfill these responsibilities. Oversight of local programs and local program assistance efforts are in some cases decreasing as other administrative responsibilities increase. Administrators' duties may need to be prioritized or otherwise limited to ensure that those deemed most important and relevant are sufficiently addressed.

Perceived Effects of Perkins. State sex equity administrators report positive effects from the Perkins Act, although not from the elimination of the set-asides. Because they do not report a decline in their ability to reach students in need or in program quality, it seems that the elimination of the set-asides has not adversely affected students or programs.

In general, administrators perceive the 1990 Perkins Act to have had a positive effect on many state and local responsibilities concerning sex equity, including states' attention to these issues and local program quality and service delivery. The new Perkins program improvement initiatives (integration, tech prep, performance standards) are also perceived as having positive effects, even though these initiatives are not directly related to sex equity issues.

It also appears that it takes more than a year for most Perkins Act effects to become evident. While some Perkins initiatives (e.g., integration, tech prep) seemed to engender initially high expectations that were tempered over time, others (e.g., competitive grant requirement) created initial confusion and concern that was alleviated over time. Overall, however, administrators did not feel that most Perkins effects could be judged until two years after implementation, at which point most administrators' views switched from noncommittal to positive.

ENDNOTES

[1] Committee on Education and Labor, House of Representatives (1976), *The Vocational Education and National Institute of Education Amendments of 1976* (Report No. 94-1085), Washington, DC: Government Printing Office.

[2] National Displaced Homemakers Network (1990), *The More Things Change . . . A Status Report on Displaced Homemakers and Single Parents in the 1980s*, Washington, DC: Author.

[3] Millsap, M.A., & Muraskin, L.D. (in press), Federal vocational education policy in the U.S. In T. Husen & T.N. Postlethwaite (Eds.), *The International Encyclopedia of Education* (2nd Ed.), Oxford, England: Pergammon Press.

[4] Muraskin, L.D. (1989), *The Implementation of the Carl D. Perkins Act: National Assessment of Vocational Education*, Final Report, Vol. II. Washington, DC: U.S. Department of Education.

[5] Cf. National Coalition for Women and Girls in Education Vocational Education Task Force (1988), *Working Toward Equity: A report on Implementation of the Sex Equity Provisions of the Carl D. Perkins Vocational Education Act*, Washington, DC: Author.

[6] Poor students are defined at the secondary level as those eligible for federal free or reduced-price lunch, and at the postsecondary level as recipients of Pell Grants or Bureau of Indian Affairs assistance.

[7] These findings are based on a series of regression equations; the statistics for these equations are presented in Appendix Table A-7.1.

[8] Table 7.2 suggests a different secondary-postsecondary split than that presented previously. There are several reasons for this. First, these data break out CBOs separately; second, different numbers of states are included in this sample; and third, these data inevitably include some error, as some administrators estimated the number and amounts of awards made.

[9] Muraskin, op. cit.

[10] National Coalition for Women and Girls in Education, op. cit.

[11] We have data on sex equity and single parent services for vocational schools but not for vocational districts. However, comparisons of data for comprehensive high schools and regular school districts show the level of service provision to be very similar at the school and district levels. This is probably true for vocational schools and districts as well.

[12] Goldsmith, D.J., Lewis, L.H., Lakes, K.D., & Pritchard, A. (1989), *It's Our Shop Too: A Study of Students in Nontraditional Occupations in Connecticut's Vocational-Technical Schools*, Hartford, CT: Vocational Equity Research, Training and Evaluation Center.

[13] Based on data from the 1989–90 National Postsecondary Student Aid Study.

[14] Appendix Table A-7.2 lists the percentage of all districts, AVSs, and two-year postsecondary institutions that offer each supplemental service for single parents, single pregnant women,

or displaced homemakers, regardless of whether they enroll these individuals in their vocational education programs.

[15] Zellman, G.L., Feifer, C., & Hirsch, A.E. (1992), *Access to and Use of Vocational Education in Teen Parent Programs* (R-4170-NCRVE/UCB), Santa Monica, CA: The RAND Corporation.

[16] Ibid., p. vii.

[17] AVSs are not examined in this section because data linking Perkins funding to AVSs are not yet available. These data should be available for the Final Report.

[18] Funded localities received Perkins sex equity funds in 1991–92; unfunded localities did not receive these funds in 1990–91 or 1991–92. Localities that had been funded in 1990–91 but not in 1991–92 were eliminated from the "unfunded" category because they offer more services than those that were "never funded." This carryover funding effect would inappropriately dilute the effects of Perkins funding if these localities had been included.

[19] Too few localities received funds only in 1991–92 to permit a separate analysis of this group.

[20] Because all administrators of Perkins Act funds should technically be covered by the Perkins mandates, the following discussion relies on information provided by all state vocational sex equity administrators, whether or not they are their state's **designated** Perkins sex equity administrator. The findings are essentially the same when only designated Perkins administrators are examined.

[21] National Coalition for Women and Girls in Education, op. cit.

[22] Administrators' feelings of overwork are not new. Similar concerns were voiced by administrators during the 1981 hearings on reauthorization of the 1963 Vocational Education Act.

[23] A relatively high proportion of administrators felt it was too early to judge the effects of the new Perkins initiatives (integration, tech prep, and performance standards), even by Spring 1993. (See Appendix Table A-7.4.)

PART III

TEACHERS AND CLASSES IN VOCATIONAL EDUCATION

CHAPTER 8

TEACHERS IN VOCATIONAL EDUCATION

INTRODUCTION

The Perkins Act calls for an assessment of "the preparation and qualifications of teachers of vocational and academic curricula."[1] This chapter discusses the qualifications of teachers in secondary and postsecondary institutions, using measures of preparedness such as teaching experience, education credentials, non-teaching work experience, and occupational credentials. It examines opinion data from a survey of secondary teachers on their preparation to teach academic and vocational subjects. It also discusses vocational teacher education in colleges and universities. Throughout, the chapter assesses teacher preparation from the standpoint of the Perkins mandate to integrate academic and vocational curricula.

In a final section, the chapter addresses the question of whether there are any shortages of secondary vocational teachers, consistent with the Perkins mandate for this assessment.[2]

SECONDARY EDUCATION

The data on the characteristics, experiences, and opinions of secondary teachers come from the 1992–93 National Assessment of Vocational Education Teacher Survey and from the Schools and Staffing Surveys (SASS) of 1987–88 and 1990–91. The populations surveyed were teachers in grades 9–12 in public schools. The populations are similar in many ways, but differ in that the vocational teachers in the Teacher Survey are those in vocational courses specifically designed to prepare students for occupations, while the SASS includes teachers of all vocational courses. [3]

Before discussing the preparation and qualifications of vocational teachers, it will be useful to look at some background information, including their numbers, their distribution across program areas, and their demographic characteristics.

Based on the SASS, in Fall 1992 the number of vocational teachers in the nation's secondary schools was estimated at 146,000. This represents a 9 percent decline from 160,000 in 1987–88. Over the same period, the number of non-vocational teachers increased 7 percent, from 667,000 to 714,000. Paralleling vocational student enrollments, the numbers of vocational teachers are decreasing both absolutely and as a proportion of all teachers.

Teachers in Vocational Program Areas

The percentage of occupational vocational education teachers in each of the main program areas is shown in Table 8.1.

Table 8.1
Distribution of Secondary Vocational Teachers by Vocational Program Area

Program Area	Percent of Teachers in Area
Agricultural education	9
Business and office	33
Health occupations	3
Marketing/distributive education	4
Occupational home economics	14
Trade and industrial education	20
Technical/communication	3
Other	3
Total	100[a]

[a] Numbers do not add to total because of rounding.

Source: National Assessment of Vocational Education Teacher Survey

Business education is the largest field, followed by trade and industry. Together, these two fields comprise over half of all secondary vocational teachers. Occupational home economics teachers make up 14 percent of the total; each of the other fields accounts for less than 10 percent.

Some of these vocational education programs tend to be offered primarily in comprehensive high schools, others primarily in vocational schools, and still others in similar proportions in both kinds of schools. Three programs — business and office education, home economics, and technology education (not shown above) — are located primarily in comprehensive high schools. Until the 1960s, business and office courses were not usually classified as vocational education; rather, they formed the core of the "commercial" track in many regular public high schools. Beginning in the 1960s, business programs were incorporated in the vocational education system, but they tended to remain in

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comprehensive high schools. Home economics and technology education (successor to the traditional industrial arts courses) were also familiar parts of the curriculum in regular public high schools and have generally remained in the same institutions.

Programs requiring large amounts of space and/or specialized equipment, such as trade and industrial education and health occupations, are usually found in vocational schools. Other programs, such as agricultural education and marketing/distribution education, are about equally distributed in both types of schools.

Demographic Characteristics

While there are demographic differences between vocational and academic teachers, they are not as great as often supposed (Table 8.2). In 1990–91 vocational education teachers were a little older, on average, than non-vocational teachers (43.5 years, as compared to 41.9 years). The difference, while small, is statistically significant ($p<.05$). Gender differences between vocational and other teachers are not significant, but some race/ethnic differences are: Vocational teachers are more likely than others to be African American.

Table 8.2
Demographic Characteristics of Secondary Vocational and Non-Vocational Teachers, 1990–91

	Vocational	Non-Vocational
Average age (years)	43.5	41.9
Sex (percent)		
Male	52	51
Female	48	49
Race/ethnicity (percent)		
American Indian or Alaskan native	1	1
Asian or Pacific islander	1	1
Black, non-Hispanic	9	6
White, non-Hispanic	88	90
Hispanic	2	3

Source: 1990–91 Schools and Staffing Survey

The major gender differences are not between vocational and academic teachers, but among vocational teachers in different program areas. Almost all the teachers in agriculture, industrial arts, and trade/industry (T&I) are male (93%, 96%, and 91%, respectively). On the other hand, almost all secondary home economics teachers are female (99%), as are about two-thirds of the business teachers (67%). These gender differences parallel those of secondary students as presented in Chapter 4. There are few substantial differences in race-ethnicity by program area, although there are some differences by age. Agriculture teachers tend to be considerably younger (38.7 years) than average, while teachers in trade and industry tend to be older (45.6 years).

In all, vocational teachers are a little older than other teachers, but they are no more likely to be male, and African Americans are over-represented. As with students, there are strong gender differences by vocational program area. Teachers in the program that many regard as typical of vocational education — trade and industry — are much more likely than non-vocational teachers to be male and they tend to be older than other teachers.

Preparation and Qualifications of Teachers

Education and Experience

Here we examine the educational credentials, teaching experience and other occupational experience of secondary school teachers. Some formal education is required for public school teaching in all states, and the educational credentials of teachers are widely considered to be measures of institutional quality. The labor market generally rewards educational credentials. Although sometimes too much or too little emphasis is given them, credentials reflect educational preparation that is essential for teaching in schools. Outside the regular education system, occupational credentials such as licenses reflect the acquisition of skills that can be essential for teaching occupationally related subjects.

Economic research suggests that experience in an occupation tends to improve performance, and pay scales usually recognize this improvement by rewarding experienced workers more than those who are beginners. [4] At some point in people's careers, however, the benefits of additional experience level off and begin to decline a little. We assume that these principles apply to teachers as well as to people in other lines of work and that teaching experience improves performance, at least up to a point.

Work experience outside of teaching, if related to the subject taught in school, can be another valuable element in teacher preparation, especially for those teaching vocational subjects. Academic teachers in school systems attempting to integrate academic and vocational subjects might also benefit from related work experience outside of school.

Data on the teaching experience, non-teaching work experience, and educational and occupational credentials of secondary teachers are provided in Table 8.3.

Table 8.3
Preparation of Secondary Academic and Vocational Teachers

	Academic Teachers	Vocational Teachers		
		All	Comprehensive Schools	Vocational Schools
Highest Degree (Percent)				
High school diploma or GED	0	2	1	4
Nonteaching occupational certificate or license	0	4	2	10
Associate's degree or 2-year certificate	*	6	2	22
Bachelor's degree	40	39	41	31
Degree above bachelor's	60	50	55	33
Mean years of teaching experience	18	17	17	14
Related nonteaching work experience (percent)	19	66	63	78

Source: National Assessment of Vocational Education Teacher Survey

On average, both vocational and academic teachers have about the same number of years' teaching experience — 17 and 18 years respectively, although teachers in vocational schools have less teaching experience (14 years) than others.

Secondary vocational teachers tend to have less formal education than academic teachers. Twelve percent of vocational teachers lack bachelor's degrees, while all academic teachers have them (they are required for academic certification in all states). Likewise, 60 percent of academic teachers have advanced degrees, compared to 50 percent of vocational teachers.

In comprehensive high schools, the education levels of academic and vocational teachers are rather similar, in most cases reflecting common certification requirements. However, teachers in vocational schools have considerably less formal education. While all academic teachers have bachelor's degrees, only 64 percent of the teachers in vocational schools do. While 60 percent of academic teachers have degrees above bachelor's, only 33 percent of the teachers in vocational schools have this much education.

For many vocational teachers, outside work experience related to teaching field seems to replace higher levels of formal education and to provide much of their subject-matter expertise. Vocational teachers are much more likely than academic teachers to have related work experience. While only 19 percent of academic teachers have such experience, 66 percent of all vocational teachers and 78 percent of those in specifically vocational schools have related work experience.

Moreover, the work experience of vocational teachers, and particularly those in vocational high schools, is more recent than that of academic teachers. For example, between 1990 and 1992, 7 percent of academic teachers, one-fifth of all vocational teachers, and one-third of those in vocational schools had (or have) jobs in fields related to their teaching.[5] Because the survey measures only work experience related to teaching field, we cannot conclude that academic teachers have little work experience outside of teaching; no doubt many have unrelated work experience.

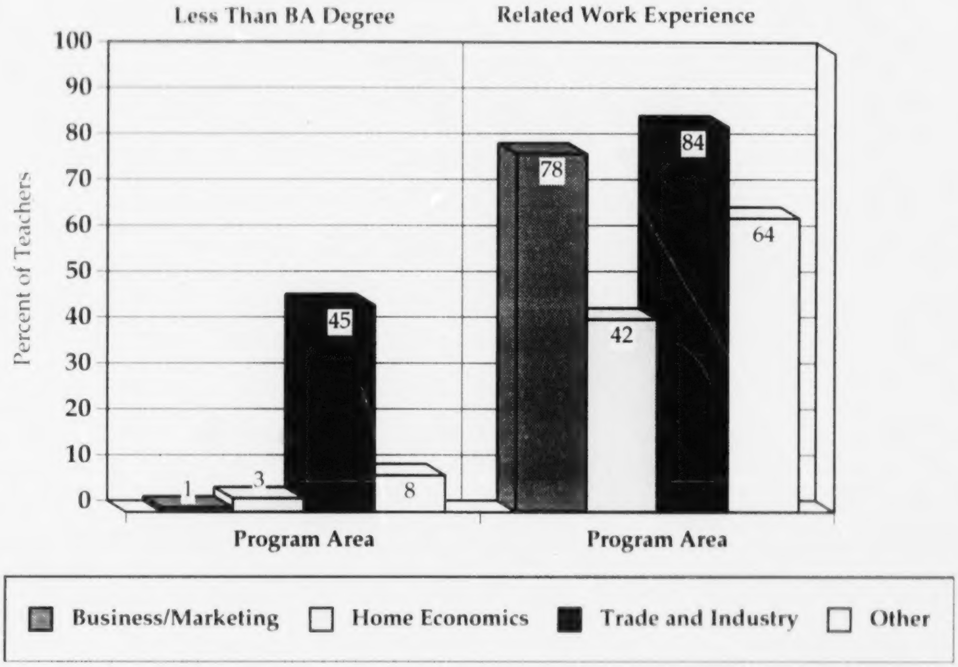
Only 23 percent of secondary vocational teachers have licenses or certificates; that is one-third of the 66 percent who have occupational experience related to their teaching field. However, this low level of licensing and certification is not necessarily a problem. All but 2 percent of vocational teachers (4% of those in vocational schools) have at least an associate's degree **or** occupational certification.

Credentials and Work Experience in T&I Education

The tendency for vocational teachers to have less education and more work experience than academic teachers is heavily concentrated in trade and industrial education, although most business/marketing teachers also have related work experience, as Figure 8.1 shows.[6]

Some 45 percent of trade and industry teachers have less than a bachelor's degree, while in other vocational fields few teachers have this little education. However, T&I teachers are the most likely to have related occupational experience. In fact, they have more than twice **as much** experience as other vocational teachers, on average, 17 years as compared to 8 years. (Figure 8.1 shows that business/marketing teachers are almost as likely as T&I teachers to have **some** related work experience, but it does not show how much they have.)

Figure 8.1
Educational Credentials and Related Work Experience of Secondary Vocational Teachers



Source: National Assessment of Vocational Education Teacher Survey

Trade and industry teachers are also more likely to have occupational credentials: 43 percent of T&I teachers have occupational certification, while only 1–9 percent of other vocational teachers do (data not shown).

This pattern of less education and more work experience goes back many years. As Lynch explains,

> Beginning with the . . . 1917 Smith-Hughes Act and continuing to the present time, nearly all states substitute years of work experience [for] college preparation [in] certifying T&I teachers. In fact, only Hawaii and Wisconsin require the baccalaureate degree for initial certification . . . Seven states require a baccalaureate degree and five states require an associate degree for full certification. Beginning teachers in 43 states may teach in T&I programs without any college credits. [7]

Most states do require from 16 to 200 hours of pedagogical preparation in the first year of teaching, typically obtained through workshops or courses. Many states also require licensure in occupations such as cosmetology, health technologies, plumbing, and auto mechanics. In addition, 12 to 18 states require individuals within the first year of teaching, or preservice teachers lacking work experience, to pass National Occupational Competency Testing Institute (NOCTI) tests.[8]

There is controversy over whether T&I teachers, or any teachers, should be allowed to teach without a college degree. Historically, vocational educators have argued that work experience is indispensable for teaching students how to perform certain kinds of jobs. Indeed, it is hard to see how teachers who have never been carpenters or plumbers could teach carpentry or plumbing to students. The question is not whether any work experience is valuable, but how much is needed and what level of formal education is needed. There is some empirical research on these subjects, and it is currently being reviewed for the Assessment.

Teachers' Perceptions of Their Abilities

To get teachers' opinions of their preparation to teach integrated courses, we asked survey respondents how well prepared they felt to teach various academic and occupational subjects. Since these are self-reports, we assume that the respondents gave themselves the benefit of the doubt in assessing their own abilities. Thus we focus on those who said they are "very well prepared" to teach a subject, assuming that response reflects a good grasp of the subject.[9]

The results of these self-assessments are shown in Appendix Tables A-8.1 and A-8.2. Vocational teachers are more likely to say they are very well prepared to teach writing (31%) than to teach basic algebra (19%) or math beyond basic algebra (10%). However, vocational teachers are not as likely as **academic** teachers to feel prepared to teach any of these subjects. The comparable proportions for academic teachers are writing, 49 percent; basic algebra, 38 percent; math beyond basic algebra, 30 percent.

Viewed by subject area, the pattern is different. Academic teachers tend to say they know their own subjects, but not other areas. For example, all math teachers say they are prepared to teach basic algebra, but only 12 percent say they are prepared to teach writing; 89 percent of English teachers say they are well prepared to teach writing, but only 2 percent say they are prepared to teach basic algebra. In contrast, some vocational teachers in each program area report being able to teach academic subjects. For example, between one-fourth and one-sixth of vocational teachers, depending on program area, say they are prepared to teach basic algebra. Between one-fifth and two-fifths report being able to teach writing. While a significant minority of vocational teachers feel that they could teach academic subjects, a smaller minority of academic teachers — 12 percent over all — say that they could teach occupational principles. Judging by these self-reports, there is probably enough knowledge on each side to begin integrating academic and vocational education, but much more preparation will be needed in the long run.

POSTSECONDARY EDUCATION

The characteristics of vocational teachers in public two-year postsecondary institutions differ somewhat from those of their secondary counterparts. The data on these faculty members come from the NCES 1988 National Survey of Postsecondary Faculty.

Demographic Characteristics

While secondary teachers are about equally distributed by gender, the faculty in two-year postsecondary institutions are more likely to be male (61%) than female (39%). This difference reflects a broader pattern in education: The more advanced the education level taught, and the higher the prestige and salaries, the more likely the faculty are to be male. Most elementary teachers are female; secondary teachers in grades 9–12 are about 50/50; two-year postsecondary faculty are about 60 male/40 female, and the proportions of male faculty in four-year institutions range from 71 percent in liberal arts colleges to 81 percent in private research universities. [10] Although both academic and vocational faculty follow this postsecondary gender pattern, vocational faculty members are a little more likely than academic teachers to be male (65%, 59%).

Faculty in two-year postsecondary institutions are also somewhat older than secondary teachers. As with gender, this age difference is part of a broader pattern in education: The higher the level of the educational institution, the higher the average age of the faculty. Postsecondary vocational faculty are a little older than their academic counterparts; 36 percent of vocational teachers are age 50 or older as compared to 31 percent of academic teachers.

The great majority of vocational teachers at both levels are white (91% of postsecondary and 88% of secondary faculty). However, while secondary vocational teachers are more likely than others to be African American, there are few significant racial/ethnic differences between academic and vocational faculty at the postsecondary level.

Experience and Education

The experience and education levels of faculty in two-year postsecondary institutions are shown in Table 8.4.

Two-year postsecondary vocational faculty have somewhat less teaching experience than other faculty. For example, 23 percent of non-vocational faculty

Table 8.4
Experience and Education of Two-Year Postsecondary Faculty (Percent of Faculty Members)

Experience and Education	Non-Vocational[a]	All Vocational	Business/Office	Health	Computer	Engineering/Science/Tech.	Trade/Industry
More than 20 years experience	23	17	20	11	9	31	19
Highest degree							
Less than bachelor's	2	15	4	12	18	29	33
Bachelor's	10	36	36	35	37	29	39
More than bachelor's	87	50	59	52	44	43	28
Major [a]							
Specific academic	53	6	6	5	11	7	1
Specific occupational	15	71	75	75	70	74	63
Education	29	22	18	20	16	17	34

[a] Non-vocational faculty comprise teachers in all fields other than vocational education. Most of them are academic teachers.

[b] Specific academic majors include mathematics, sciences, social sciences, letters, humanities, communications, art, and design. Specific occupational majors include the occupational categories in the column heads. A small "other" category is excluded from the types of majors.

Source: Hoachlander, G. et al., *Vocational Education in the United States, 1969–1990*, Washington DC: National Center for Education Statistics, 1992, p. 125

and 17 percent of vocational faculty have more than 20 years' experience teaching. Among vocational teachers in the various subject areas, there are substantial differences in experience. Only 9 percent of the computer faculty have more than 20 years' experience, presumably because this is a relatively new field. On the other hand, 31 percent of the faculty in engineering/science/technology have been teaching for more than 20 years (and two-thirds have been teaching 10 or more years).

As at the secondary level, two-year postsecondary vocational faculty have less formal education than their academic counterparts. This is especially the case for faculty in postsecondary trade and industry programs, probably for the same reasons discussed above. Surprisingly, the distribution of highest degrees for all postsecondary vocational faculty is very similar to that for secondary teachers. Some 15 percent have less than a bachelor's degree, as compared to 12 percent of secondary teachers; 36 percent have BAs, as compared to 39 percent of secondary teachers; and 50 percent of both groups have advanced degrees. Because the non-vocational faculty at the postsecondary level have considerably more education than at the secondary level, the differences between postsecondary non-vocational and vocational faculty are greater than those in secondary schools.

Considered by subject field, between 43 and 59 percent of two-year postsecondary vocational faculty have advanced degrees, with one exception: Only 28 percent of those in trade and industry have advanced degrees, and one-third of them have less than a bachelor's degree. It is also significant that a relatively high proportion of teachers in the engineering/science/technology field (29 percent) have less than a bachelor's degree.

In the case of secondary teachers, we saw that outside occupational experience and credentials seem to take the place of formal education, especially in trade and industry programs. We do not have data on the occupational experience of two-year postsecondary faculty, but the fact that vocational faculty tend to have less formal education, especially in trade and industry, suggests that they may be more likely than others to have non-teaching work experience and occupational credentials.

A substantial majority of postsecondary vocational faculty (71%) were trained in specific occupational fields, while a bare majority (53%) of non-vocational faculty were trained in specific academic fields, such as math, English, and the social sciences. If teachers' education in specific subjects enhances their performance, postsecondary vocational faculty have an advantage in this respect. The proportion of vocational faculty with specific occupational training is fairly constant across subject matter fields, except for those in trade and industry. A smaller proportion of trade and industry faculty have specific training than do other vocational teachers and a larger proportion were general education majors.

The data in Table 8.5 tell us something about the relative status and salaries of non-vocational and vocational faculty members in two-year postsecondary institutions. At the time of the survey (1988), vocational faculty had somewhat lower formal status than other faculty in public two-year postsecondary institutions. They were less likely to be professors and more likely to be assistant professors, instructors, or lecturers. Moreover, at each level of rank except one, the average salaries of vocational faculty were slightly lower than those of other faculty (the exception is at the professorial level). The combination of lower status and lower pay within rank meant that the mean salaries of vocational faculty were lower than those of other faculty members ($30,953 vs. $33,460).

Table 8.5
Rank and Salary of Two-Year Postsecondary Faculty

	Percentage of Faculty		Average Salary ($)	
	Non-Vocational	Vocational	Non-Vocational	Vocational
Professor	12	7	38,887	39,972
Associate Professor	5	6	36,103	33,247
Assistant Professor	5	8	31,165	29,263
Instructor	48	59	30,412	29,247
Lecturer	2	4	—	—
Other	3	3	—	—
Not applicable	25	14	—	—
	100	100		

Source: Hoachlander, G. et al., pp. 127, 129.

Two qualifications to these findings must be noted. First, some two-year institutions do not have rank. The usual academic ranks were not applicable to 25 percent of non-vocational faculty and 14 percent of vocational faculty, and no salary data are available for these categories. Second, we do not have information on the part-time/full-time status of faculty by rank. Since part-time pay is lower than full-time, the proportion of part-time faculty at a given level will affect the mean salary at that level. In any event, formally ranked vocational faculty tend to have lower status and receive lower pay than other faculty members.

PREPARATION OF VOCATIONAL TEACHERS IN COLLEGES AND UNIVERSITIES

In this section we examine the preparation of secondary and postsecondary vocational teachers in teacher education programs. First, however, it is important to understand that programs for training vocational teachers are shrinking in the face of budget pressures and declining secondary vocational enrollments. As Lynch observes,

> Evidence is abundantly clear that at [the]. . . national level, enrollments in teacher education have declined significantly in most vocational subject areas, programs have been

> eliminated, and. . . teacher educators, although still employed at the universities, have found work in other than vocational education. [11]

In program after program, the picture is the same :[12]

- A 62 percent decline in newly qualified agriculture teachers between 1975 and 1990.
- A 37 percent decrease in the number of institutions offering marketing education since 1989.
- A 15 percent decrease in graduates of home economics education programs between 1987 and 1989.
- A 70 percent decline in technology/industrial arts education majors over the last 20 years.

Only in the area of vocational special needs has there been an increase in enrollments of teacher-trainees (14% over three years), no doubt reflecting the greater number of special population enrollments discussed in Chapter 4.

Coursework of Prospective Vocational Teachers

What kind of courses do prospective vocational teachers take in colleges and universities? How well prepared are they to teach integrated academic and vocational education?

A recent analysis of the transcripts of vocational teachers who received baccalaureates from 22 Southern universities [13] found that 30 percent of their coursework in general studies (including the liberal arts) was transferred from other institutions, presumably community or technical colleges, for the most part. Almost all of it (92%) was completed in lower division courses in the freshman and sophomore years. Further, this coursework was more concentrated in the social sciences, humanities, and English than in math and science. Vocational graduates of these programs have completed an average of eight credits in math — probably a one-semester course in math and one computer course — and 10.5 credits in the natural sciences. The authors comment that there may be deficiencies in the undergraduate programs of vocational teachers.

> It seems clear that, in general, beginning vocational education teachers did not pursue a rigorous liberal arts program . . . Moreover, T&I teachers took significantly fewer courses in these academic areas in their preservice preparation than any of the other beginning vocational teachers.[14]

They also note that

> This is of particular concern if these graduates begin their careers by working with teachers of mathematics, science, and other general areas in the integration of academic and vocational education.[15]

Similarly, Lynch observes that

> It can generally be assumed that [graduates receive] industry- or business-based occupational experience, preparation to work with at-risk or special needs students, a course in computer applications, preparation on advising vocational youth organizations, preparation to work with business- or industry-based groups, and experience in a prestudent teaching clinical environment. It is less likely that they [receive] instruction in integrating basic skills with vocational education.[16]

Lynch notes that other researchers have also concluded that "vocational education teachers are not prepared to teach basic skills in integrated education programs."[17]

Informing Prospective Teachers About Perkins Reforms

Postsecondary institutions providing preservice education for vocational teachers have begun to take some steps to inform students about the Perkins Act. Information from 20 universities affiliated with the University Council on Vocational Education indicates that most institutions are working within existing courses to increase awareness of integration and tech prep. These efforts typically involve the use of video and printed materials, guest speakers, field trips, teleconferences, and applied academics materials. A few universities have developed credit courses in integration and tech prep.

Whether these changes do more than scratch the surface, however, is open to question. One participant in a tech-prep focus group of state administrators of vocational education observed that:

> Nothing is being done at the university level. At every conference I go to, I ask how many people in the audience [are involved in tech prep]; they are just not involved. On a preservice basis, it's business as usual . . . . They don't even know what we are talking about when we say tech prep.[18]

Postsecondary institutions with preservice vocational programs seem to be more active in promoting work experience and links with employers. Most have co-op or other work experience programs. Five of the 20 universities affiliated with the

University Council on Vocational Education have new courses on apprenticeship, education-labor force linkages, or work-based education programs. Six others have infused school-to-work transition issues in their work experience programs. [19]

Useful as this information may be, however, it will not provide the solid academic base that prospective vocational teachers need to help integrate curricula in high schools. That will require a reconsideration of the college graduation requirements for these students.

THE DEMAND FOR VOCATIONAL EDUCATION TEACHERS

The Perkins Act calls for an assessment of the "shortages" of vocational and academic teachers.[20] Table 8.6 addresses this question with SASS data showing the percentage of secondary schools with vacant teaching positions in a number of different fields; the proportion of those that said it was very difficult or impossible to fill the vacant positions; and the resulting proportion of schools that had positions that were very difficult or impossible to fill (the product of the first two columns).

Table 8.6
Indicators of Demand for Teachers in Public Secondary Schools

	Percent of Schools With Teaching Vacancies	Of Schools With Vacancies, Percent Saying Vacancies Very Hard to Fill	Percent of All Schools With Hard-to-Fill Vacancies
Vocational Education	27.5	17.4	4.8
Math	39.6	12.6	5.0
English	42.1	4.8	2.0
Physical Science	26.5	19.3	5.1
Biological Science	25.2	14.6	3.7
Foreign Language	26.1	27.0	7.0
Special Education	37.5	27.1	10.2
ESL	9.0	35.2	3.2

Source: 1990–91 Schools and Staffing Survey

The proportion of districts with vacancies in vocational education was about average — less than the percentage of schools with vacancies in English, math, and special education, more than the percentage of schools with vacancies in English-as-a-Second Language.[21] Similarly, the proportion of schools with vacancies in vocational education that found those vacancies *very difficult* or *impossible* to fill was also in the middle range of the various subjects.

Consequently, the same is true of the proportion of **all** secondary schools with hard-to-fill positions. An estimated 5 percent of all schools had hard-to-fill positions in vocational education, about the same as the proportions for math and the physical sciences. Comparable proportions in other subjects ranged from 2 to 10 percent. (About 3 percent of schools were in districts that offered teachers free retraining or pay incentives to teach vocational education.) The subject in which there clearly was a shortage, relative to other subjects, was special education.

The SASS data, then, do not suggest that there is an unusual shortage of vocational teachers. The market for their skills is about the average for all teachers. Given the decline in the numbers of secondary vocational enrollments, it is surprising that there are as many vocational teaching vacancies as there are. However, we have seen that preservice vocational training programs in colleges and universities are being cut back. Apparently, supply is adjusting to demand.

CONCLUSION

The field of secondary vocational teaching has some significant problems. Paralleling student enrollments, the numbers of vocational teachers are declining, while the numbers of other teachers are increasing. There is no shortage of vocational teachers, and college and university programs in vocational teacher education are being cut back.

Secondary vocational teachers tend to have less formal education than others, but they have more related occupational experience and credentials. This emphasis on occupational experience in lieu of formal education is concentrated in trade and industry education, where it has been guided by state policies in a tradition going back to the Smith-Hughes Act of 1917. Data from a number of studies suggest that vocational teachers, and T&I teachers in particular, do not have the academic background necessary to facilitate the integration of academic and vocational curricula over the long term. Similarly, academic teachers' lack of knowledge about occupational subjects may hinder integration. Nevertheless teachers on both sides have enough knowledge in common to begin the process.

Postsecondary vocational faculty also have less formal education than others, although they are more likely to have subject-specific training. In fact, the educational level of postsecondary vocational faculty is about the same as that of secondary vocational teachers. Again, those in trade and industry have less education than those in other vocational fields, probably for the same reason as in secondary schools.

By traditional standards of education, the findings suggest that vocational teachers, and especially those in trade and industry, are less qualified than academic teachers. However, there is debate about whether the traditional standards are the right ones to apply. Some vocational educators point out that the standards are designed primarily for academic teachers. Occupational experience, they believe, is the more important and relevant measure of quality in vocational education. The Assessment is currently examining this issue.

Nevertheless, data on the education level of vocational teachers, the Perkins mandate to integrate academic and vocational curricula, and the Perkins emphasis on rigorous academics for students in vocational programs lead to the conclusion that vocational teachers need more formal education and better preparation in academic subjects. The place to start is with state certification requirements for teachers in trade and industry. If they had as much education as other vocational teachers, the educational differences between academic and vocational teachers in general would be much smaller.

It also seems clear that academic teachers who are going to participate in integrated education programs need to know more about the world of work. Which academic teachers, and how many, need more occupational knowledge will depend on the form that integration takes in a high school or postsecondary institution.

ENDNOTES

[1] Section 403 (b) (3).

[2] Ibid.

[3] Apart from the timing of the two surveys, there are important differences in their design. For this chapter, the most important difference is that the National Assessment Teacher Survey included only those vocational teachers who were training students for occupations, while the SASS included all vocationally oriented teachers. In particular, the SASS included all home economics and industrial arts teachers, while the Teacher Survey included only the teachers of those courses specifically designed to prepare students for occupations (e.g., commercial food preparation in occupational home economics). The occupational and non-occupational vocational teachers in the SASS cannot be distinguished. Thus, the characteristics associated with teaching for occupations are more pronounced among the National Assessment teachers than among the SASS teachers. This chapter and the next rely mainly on data from the Teacher Survey, so the teachers referred to are primarily those who teach occupational vocational courses. Only the SASS data will refer to non-occupational teachers as well.

[4] Hamermesh, D.S., & Rees, A. (1984), *The Economics of Work and Pay*, New York: Harper and Row.

[5] It is also interesting that teachers in vocational high schools are about twice as likely as other teachers to have had related work experience in the Armed Forces: 12% vs. 6%. The tendency of vocational schools to hire former military members is of particular interest during this time of reductions in military manpower. Virtually all enlisted personnel have high school diplomas; many have some college, often acquired in the military; and most have acquired vocational-technical training and work experience in the military.

[6] Relatively high proportions of health occupation teachers also lack college degrees, but their numbers are small.

[7] Lynch, R.L. (1993), *Vocational Teacher Education in U.S. Colleges and Universities and Its Responsiveness to the Carl D. Perkins Vocational and Applied Technology Act of 1990*, p. 11, University of Georgia, School of Leadership and Lifelong Learning.

[8] Ibid. p. 17.

[9] Most teachers of a subject describe themselves as "very well prepared" to teach it. For example, 100 percent of math teachers say they are "very well prepared" to teach basic algebra. None describes him or herself as being less prepared than that. Eighty-nine percent of English teachers describe themselves as "very well prepared" to teach writing, and so on.

[10] Russell, H., et al. (1990), *Faculty in Higher Education Institutions* (NCES 90-365), Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement; Hoachlander, E.G., et al. (1992), *Vocational Education in the United States, 1969–1990* (NCES-92-669), Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

[11] Lynch, op. cit., pp. 5-6.

12 Ibid. pp. 6–11.

13 Finch, C.R., et al. (1992), *Course-Taking Patterns of Vocational Teacher Education Baccalaureate Degree Recipients; Teacher Preparation, General Education, and Teaching Content Area Studies*, Berkeley, CA: National Center for Research in Vocational Education, in the literature review by Lynch, op. cit., pp. 20–22.

14 Ibid., p. 22.

15 Ibid.

16 Lynch, op. cit. p. 22.

17 Ibid.

18 National Assessment of Vocational Education Focus Group on Tech Prep; meeting of the National Association of State Directors of Vocational and Technical Education, Kansas City, September 1992.

19 Lynch, op. cit., pp. 28–34.

20 Section 403 (b) (3).

21 The probability that a vacancy will occur in a particular field in a school is a function of the number of teachers in that field in that school. The SASS data do not permit these estimates, but calculations at the aggregate teacher level indicate that taking number of teachers into account does not substantially change the conclusions drawn from Table 8-6, except that shortages of special education teachers are much more pronounced than the table suggests.

CHAPTER 9

TEACHING PRACTICES AND CLASS CHARACTERISTICS IN SECONDARY VOCATIONAL EDUCATION

INTRODUCTION

This chapter examines vocational and academic classes in secondary schools, using information from the National Assessment of Vocational Education Teacher Survey and the Omnibus Surveys. It describes some of the characteristics of these classes and the activities that occur in them.

The chapter assesses the academic content of vocational courses, consistent with findings in the previous National Assessment of Vocational Education and with provisions of the Perkins Act. The 1989 assessment noted that

> Given its sizable role [in secondary education], if vocational education could contribute to academic skills development, it would be an important new vehicle for preparing youth with marketable academic as well as occupational skills. Expanding its academic potential should be a major objective of federal policy.[1]

The Perkins Act requires that state plans include assessment of

> the capability of vocational education programs to provide vocational education students, to the extent practicable, with . . . strong development and use of problem-solving skills and basic and advanced academic skills (including skills in the areas of mathematics, reading, writing, science, and social studies) in a technological setting.[2]

The chapter then examines course requirements in vocational programs to determine how many provide a "coherent sequence of courses,"as called for in the Perkins Act.[3] It also assesses the emphasis given to a range of vocational, academic, and SCANS[4] skills in secondary vocational courses by examining their contribution to students' grades. The chapter concludes with a description of the major problems in secondary vocational education, as seen through the eyes of teachers.

The National Assessment of Vocational Education Teacher Survey collected information on the instructional practices, educational standards, teaching experiences, and opinions of a random sample of secondary vocational and academic teachers. Each teacher was asked to provide information on a specific class that he or she taught.[5]

CLASS CHARACTERISTICS AND TEACHING PRACTICES

The academic classes on which the teachers reported were fairly evenly distributed across grades 9, 10, 11, and 12, while the vocational classes were more heavily concentrated in grades 11 and 12. Some 45 percent of the academic classes were in these two grades, as compared to 62 percent of all vocational classes and 74 percent of vocational classes in vocational schools.

In vocational programs, we expect to find somewhat lower teacher/pupil ratios because the availability of equipment may limit the number of students a class can accommodate, and the presence of equipment may require more individual supervision of students. In the present sample, the mean size of the vocational classes surveyed was a little smaller than that of the academic classes — 21 as compared to 24 students. The difference is statistically significant ($p<.05$), but not dramatic. It may confer a slight quality advantage on vocational students, inasmuch as smaller classes give teachers better control and students more personal attention.

Classes in vocational schools are typically longer than the classes in comprehensive high schools. Academic and vocational classes in the comprehensive schools average five hours a week, or one hour a day, fitting conveniently into the master schedule. However, the classes in vocational schools average 14 hours a week. Most of these institutions are area vocational schools where students are sent from comprehensive high schools for half of each day. There they receive a little less than three hours of instruction daily, on average.

Teachers in the survey provided information on the teaching and learning activities that took place in the designated classes when they met most recently. Table 9-1 shows their responses to these questions.

When we think of traditional academic classes, we usually think of a teacher in front of the class lecturing, or of students at their desks writing or taking tests. When we think of vocational classes, we may think of students working at some occupational task, whether styling hair or tearing down a car engine, with the teacher moving around the room monitoring student activities, providing advice and instruction as needed. To what extent are the activities reported in our survey classes consistent with these images?

First, let us look at some classroom activities traditionally regarded as "academic," especially those involving verbal instruction and students' use of pencils and paper. Such activities include lectures, in-class writing assignments, and tests or quizzes. The survey data indicate that the occurrence of these

Table 9.1
Activities in Most Recent Class
(Percent of Teachers Reporting Each Activity)

Activities	Academic Classes	Vocational Classes		
		All	Comprehensive High Schools	Vocational Schools
Lecture	75	77	75	83
Students writing a paragraph or more	54	42	41	42
Test or quiz	42	43	40	58
Students using computers	13	40	41	36
Students using instruments, tools, or equipment	37	73	70	88

Source: National Assessment of Vocational Education Teacher Survey

activities in academic and vocational classes does not conform to the popular image of vocational education as strictly "hands-on" instruction.

Lectures were very common in both academic and vocational classes, occurring in around three-quarters of the classes. Surprisingly, they were most common in the vocational schools. Some 83 percent of the classes in vocational schools (and incidentally, the same proportion of trade and industry classes) involve lectures.

In-class writing assignments were also fairly common in both types of classes. Vocational classes were less likely than academic classes to require students to write a paragraph or more, but the difference (42%, 54%) was not dramatic. Tests or quizzes occurred about as frequently as writing assignments, in a little over 40 percent of both academic and vocational classes. Again, we find more of this traditional "academic" activity in vocational high schools (58%) than in academic classes (42%).

Of course, the survey data cannot tell us whether the lectures were interesting or boring, the writing assignments basic or advanced, the tests difficult or easy. However, the evidence here indicates that these traditional "academic" activities occur at rather similar rates in academic and vocational classes, and that classes in vocational schools especially have more of them than one would expect.

It should be emphasized that these are not the only teaching activities that occur in classes. The longer classes in area vocational schools especially allow for a wide range of activities. Our case studies and site visits provide many examples of vocational classes beginning with a lecture and then proceeding to work on occupational projects.

"Hands-on" activities are usually regarded as the domain of vocational education, and here the data do support the prevalent view. The survey asked questions about the use of computers and of instruments, tools, and equipment in the classroom. Although the use of computers for written communication, mathematical calculations, and so on would seem to be a logical part of academic education, computers are not usually available in academic classes. Only 13 percent of these classes involved students using computers on a particular day. In contrast, 40 percent of the vocational classes in the sample involved students using computers.

In secondary schools, the computers tend to be located in vocational programs, particularly in business and office education. However, these computers are often available to students for academic coursework. It is not unusual to see students writing English or history papers on word processors in the business classrooms.

We would expect instruments, tools, and equipment to be used extensively in vocational programs and in the lab sciences. According to the teachers' reports, this occurred in almost three-fourths of the vocational classes and a little more than one-third of the academic classes sampled. Teachers in vocational schools were especially likely to report students involved in such activities: 88 percent of them did so. As observed earlier, area vocational schools were built in part to accommodate specialized equipment.

The data on these class activities do not indicate broad quality differences between academic and vocational education. Lectures are widely used in both types of classes; tests and quizzes are fairly frequent, especially in vocational schools. Vocational classes are less likely to involve writing assignments but more likely to involve the use of equipment, including computers.

The Use of Academics in Vocational Classes

The emphasis of the 1989 National Assessment on using vocational education in part as a vehicle for academic instruction, the Perkins Acts emphasis on academics in vocational programs, and the broad emphasis in both documents on integrating academic and vocational education raise empirical questions about the academic content of vocational classes and the occupational content of academic classes. The Teacher Survey data enable us to address these questions.

The data files contain information on the proportions of time spent in academic and vocational classes working on algebra, writing, biology, chemistry, physics, and occupational principles. We will focus on basic algebra, math beyond basic algebra, writing, and occupational principles, because these subjects are arguably the broadest and most likely to be involved in efforts to integrate curricula. On the assumption that more than 10 percent of class time is a minimum needed to convey much useful information on a subject, Figures 9.1 and 9.2 and Appendix Table A-9.1 show the percentages of classes spending this much time on the subjects.

Except in writing assignments, the proportions of all vocational teachers who devote even the minimum amount of time to academic material in their classes are quite small, 11 percent or less (Table A-9.1). The proportions working with these subjects for longer periods — 25% of the time or more — are smaller still; only 1 to 3% of vocational teachers spend this much time on basic algebra, more advanced math, biology, chemistry, or physics. (Data not shown.)

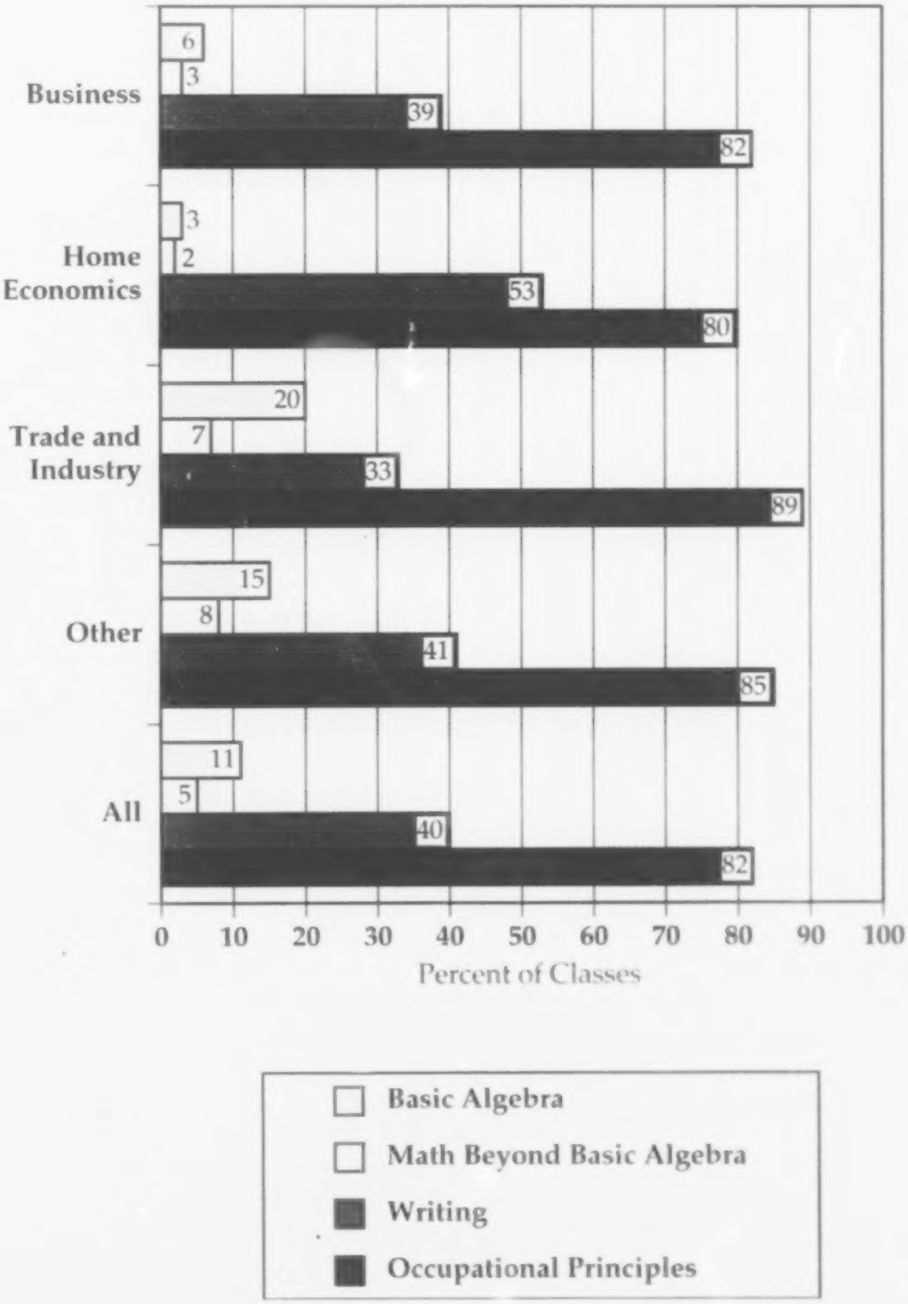
Classes in trade and industry and the "other" vocational category (which includes technical/communications and agricultural education, among other things) tend to involve more math than all other subjects except math and science. Still, only one T&I class in five devotes more than 10 percent of the time to basic algebra problems, and only one in 14 devotes that much time to more advanced math. Although vocational classes do involve a fair amount of basic math (addition, subtraction, multiplication, division, percentages, fractions, decimals), as we will see shortly, few reach the level of Algebra I.

All types of academic classes except math are more likely than vocational classes to involve at least some writing. Sixty-two percent of academic classes and 40 percent of vocational classes devote at least a minimum amount of time to writing. Among vocational classes, home economics is the most likely to involve some writing, trade and industry the least.

As expected, academic classes are unlikely to give much attention to occupational subjects. Only 18 percent spend the minimum amount of time on occupations. Math classes are more likely to give some attention to this subject (28% do), perhaps because of the applied math courses being taught.

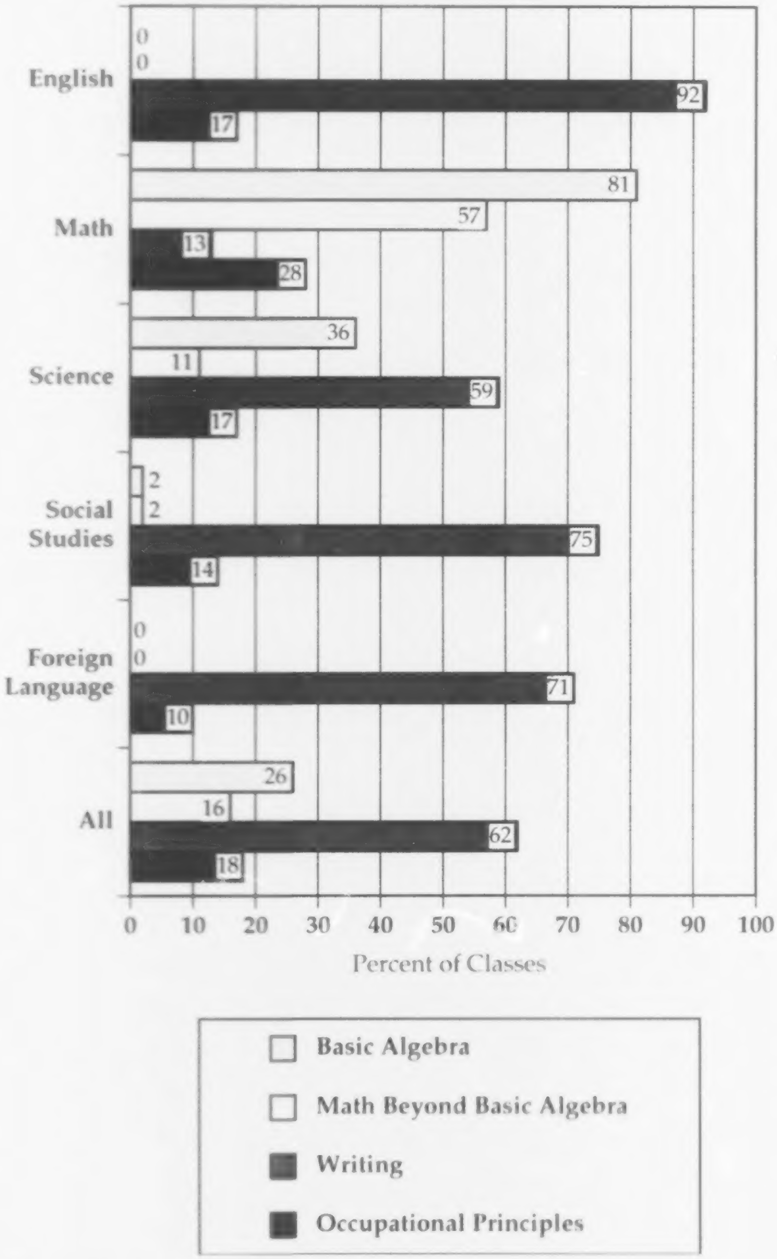
In general, we see some elements of academics in vocational curricula and of occupational subjects in academic curricula, but they are sparsely distributed.

Figure 9.1
Percent of Vocational Classes Spending More Than Ten Percent of Time on Specified Subject



Source: National Assessment of Vocational Education Teacher Survey

Figure 9.2
Percent of Academic Classes Spending More Than Ten Percent of Time on Specified Subject



Source: National Assessment of Vocational Education Teacher Survey

Homework

The assignment of homework is a traditional way of increasing the amount of time students spend on a subject, and there is research evidence that homework improves students' performance in school. [6] For this reason, we assessed the extent to which homework is assigned in academic and vocational classes. The Teacher Survey asked teachers about the amount and kind of homework they gave their students. Table 9.2 shows the responses.

Table 9.2
Homework Assignments of Selected Classes

		Vocational Classes		
Characteristics	Academic Classes	All	Comprehensive High Schools	Vocational Schools
Homework assigned in this class? Percent "yes."	95	59	57	65
Homework assigned on October 1, 1992? Percent "yes."	81	45	44	50
Mean hours of homework in last 5 school days	3	2	2	2
Percent[a] saying homework involves:				
Reading assignment	69	69	66	80
Short-answer questions	54	58	57	61
Essay writing	32	16	15	17
Basic mathematical computations	28	40	39	46
Advanced mathematical or scientific problem solving	23	10	8	15
Non-academic job skills	6	42	40	49

[a] Percent of those reporting that homework is assigned in the class.

Source: National Assessment of Vocational Education Teacher Survey

There are marked differences in the proportions of academic and vocational classes requiring homework. In almost all the academic classes (95%), teachers assign some homework. On the other hand, only 59 percent of vocational classes assign any homework. (On October 1, 1992, homework was actually assigned in 81% of the academic classes and 45% of the vocational classes.)

On average, vocational classes were about three-fifths as likely as academic classes to have homework. The amount of homework assigned in vocational classes is only about two-thirds the amount assigned in academic classes (an average of two hours a week in vocational classes and three hours in academic classes that assign it). By multiplying the three-fifths and the two-thirds, we can arrive at a rough measure of the relative homework demands made on students in the two kinds of classes: On average, vocational students are assigned about 40 percent as much homework as academic students.

There is also a difference **among** vocational classes in different kinds of schools in the tendency to assign homework. Teachers of the classes in vocational schools are more likely to require it than vocational teachers in comprehensive high schools, although the average amount of homework is the same. By program area, T&I classes are the least likely to require homework; only about half (52%) of them do so.

The Survey also provides information about the content of the homework assigned in these classes.[7] As expected, most teachers who assign homework give frequent assignments in reading (69%). Academic and vocational teachers do not differ in this respect, although the teachers in separate vocational schools are more likely than others to assign reading frequently. Writing short answers to questions is also fairly common; teachers in vocational classes are a little more likely than those in academic classes to give such assignments frequently.

With regard to essay writing, there is a marked difference between academic and vocational classes. Academic teachers who require homework are twice as likely as vocational teachers to assign essays frequently (32%, 16%). We saw earlier that vocational students are also less likely than academic students to be assigned any writing in class.

As regards math homework, a different picture emerges. Vocational teachers who require homework are more likely than academic teachers to assign **basic** math problems frequently. However, they do not frequently assign problems in **advanced** math and science. Teachers in vocational schools who require homework are more likely than vocational teachers in comprehensive high schools to assign math frequently. Courses that require substantial math, such as electronics, tend to be concentrated in vocational schools, while courses requiring less math, such as those in home economics, industrial arts, and business, tend to be located in comprehensive high schools.

Academic teachers generally do not assign homework regarding occupational subjects. Only 6 percent of the academic teachers who assign homework require work on non-academic job skills. In this respect, as in some others, patterns in homework assignments resemble those in classroom assignments.

Vocational Program Requirements

Secondary vocational programs are not very demanding academically, but they were not designed primarily to teach academic skills. How demanding are they in preparing young people for work? Our Community Case Study and Omnibus Survey data provide some information on this subject. Course materials collected in the 20 case study sites contain information on pre-requisites for vocational courses. In addition to this information on "entry requirements," the Surveys contain data on completion requirements for vocational programs.

An examination of the vocational course materials from the case study sites indicates that vocational courses usually do not have prerequisites. They are generally open to all students in a given grade range. This "open admissions" approach is often seen as necessary to help maintain vocational enrollments, which are on the decline, and is often defended on equal access grounds. At the same time, this approach forgoes an effective means of linking vocational courses with relevant academic courses and with other vocational courses. Easy-entry, stand-alone vocational courses may serve the interests of students who want to explore vocational areas, acquire a limited set of specific skills, or fill out an otherwise demanding schedule with an easier course. But they do not facilitate the concentration of vocational courses that is associated with better employment outcomes (see Chapter 15).

In fact, only about half of the regular school districts (51%) require course concentration in a vocational program area for program completion. The other half either have no definition of a vocational completer (34%) or require a specified number of vocational courses, regardless of program area, for completion (14%). Regular districts account for most secondary vocational education: according to school administrators, a median 90 percent of all vocational courses are taken in comprehensive high schools.

To the extent that we can judge from these entrance and completion requirements, secondary vocational programs in general are not very demanding as educational systems for preparing young people for work. We do not have much information on the occupational skill content of vocational courses and do not know how well students learn specific occupational skills in them. However, the next section describes the extent to which occupational, academic, and other skills contribute to the grades students receive.

Factors in Teacher Grading Decisions

The factors that affect secondary students' grades are important because they reflect many of the underlying values in the classroom. They indicate what the teacher, and the educational system, value in student performance. The Survey asked teachers how much each of 18 different factors contributed to the grades of students in their designated classes. There are three types of factors: traditional academic skills, SCANS skills (explained below), and traditional vocational skills.

The SCANS skills were generated by the (Department of Labor) Secretary's Commission on Achieving Necessary Skills. [8] They were designed to prepare young people for work in an internationally competitive economy, one in which the high-performance workplace described in Chapter 12 plays an increasingly important role.

The SCANS report lists eight competencies needed for good job performance. The first five are **workplace** competencies: (1) knowing how to allocate resources; (2) interpersonal skills; (3) knowing how to handle information; (4) understanding organizational systems; and (5) knowing how to use technology. The last three are **foundation** skills: (1) basic skills, such as reading, writing, and basic math; (2) thinking skills, such as knowing how to reason; and (3) personal characteristics such as responsibility and integrity. (See Appendix 9-A for the full list.)

The Survey asked a series of questions to determine how much academic skills and SCANS skills contribute to students' grades. It also asked about vocational skills and students' ability to apply academics to occupational tasks. The proportions of teachers saying that a given skill contributes to students' grades in their classes "to a great extent" are shown in Appendix Table A-9.2.

The data in Table A-9.2 reinforce the impression gained earlier that although basic reading and math abilities play a role in vocational education, advanced academic competencies generally do not. In some cases, even basic academic skills contribute relatively little to vocational grades. For example, about two-fifths of academic teachers but less than one-fifth of vocational teachers said that writing skills were very important in determining grades. Basic reading skills contributed greatly to the grades in 60 percent of academic classes, but only 45 percent of vocational classes. On the other hand, academic and vocational teachers were equally likely to say that students' basic math skills contributed greatly to their grades.

Advanced reading and advanced math skills play a relatively small part in the grades of vocational students, and science knowledge, whether basic or advanced, is seldom an important contributor. The proportion of vocational teachers saying that these competencies contribute greatly to grades is 12 percent or less. Academic teachers are about three times as likely as vocational teachers to say that advanced math skills, advanced reading skills, or advanced science knowledge play a very important role in their grades.

The survey used a series of items to assess the role of the five SCANS workplace competencies in grading. "Completing work on time" was used as a measure of ability to allocate resources (such as time). "Teamwork skills" are a measure of the interpersonal competencies called for by SCANS. "Research/reference skills" help measure the role of information management competencies. "Understanding of organizational and technical systems" and "ability to use technology" are measures of system awareness and skill in using technology, respectively. Among the SCANS foundation skills, basic skills in reading, math, and writing were discussed above. "Oral communication" is a measure of "speaking and listening skills"; "creative thinking and problem solving" is used to assess the role of the SCANS "thinking skills"; and the Survey's "self-management skills" is designed as a measure for the SCANS "personal qualities."

Among the workplace competencies, completing work on time played a fairly prominent role in the grades given by both types of teachers. Just under half of the academic and vocational teachers said that completing work on time contributed greatly to student grades. Teamwork skills, understanding of organizational and technical systems, and ability to use technology were more likely to be important in the grading decisions of vocational teachers. Between 27 percent and 37 percent said that these skills were very important considerations in grading, whereas only 13–15 percent of academic teachers said so. Research and reference skills played a small role in grading, but academic teachers were more likely than vocational teachers to say that they were very important (12% and 7% respectively).

Among the personal skills, creative thinking was about equally important to academic and vocational teachers (44%, 41%), but self-management skills were somewhat more likely to be regarded as important by vocational teachers (52%) than by academic teachers (40%).

Apart from SCANS skills, vocational competencies were predictably important in the grading decisions of vocational teachers and not very important in those of academic teachers. The same is true of students' ability to apply academic concepts to occupational tasks. About half of the vocational teachers said that these competencies were important in their grading decisions, as compared to 4–11 percent of academic teachers.

As a rule, teachers in vocational schools were more likely than vocational teachers in comprehensive high schools to say that student competencies were very important in their grading decisions. In a number of areas, vocational school teachers were the most likely of all to say that certain competencies were very important. These include basic math skills, teamwork skills, understanding of organizational and technical systems, oral communication, job-specific skills, and general employability skills. Clearly, vocational schools are the places where SCANS skills are most likely to be emphasized.

SCANS Skills in Perspective

The SCANS skills are relatively new, and their contribution to job performance is a subject that requires investigation. The one empirical study of SCANS that has been completed finds that the foundation skills, which emphasize academics, thinking skills, and character, are significantly related to job performance in the utilities industry. [9] The "workplace competencies" are not significantly related to job performance, with one exception — information management, probably the most academic of these competencies.

While more research is needed on SCANS skills, the results of this study suggest that the relative emphasis on SCANS **workplace competencies** in vocational schools and programs may not contribute much to job performance later on. The one workplace competency that is related to job performance in the study — information management — is the least emphasized SCANS skill in vocational grading decisions.

Vocational programs show some areas of strength and some of weakness in preparing secondary students in the SCANS **foundation skills**. Among the basic skills, vocational education shows some strength in its emphasis on basic math in homework assignments and grading decisions. (However, the homework is limited, and the math tends to be at levels below Algebra I.) The importance of oral communications in grading decisions is also a strength. On the other hand, vocational education is relatively weak in promoting writing in classes, homework assignments, and especially grading decisions. The emphasis on reading is mixed.

Among the personal characteristics, the role of self-management in grading decisions is a strength. As we will see shortly, teachers regard the lack of motivation and the absenteeism of vocational students as major problems, and efforts to improve their comportment are well placed. The measure of thinking skills — creative thinking and problem-solving — shows strength in vocational grading decisions, but is too broad to permit firm conclusions.

Measures of Student Performance

This section looks briefly at the ways in which vocational and academic teachers measure student performance. While factors in grading decisions reflect the educational values of the class, performance measurement makes it possible to chart students' progress and identify areas where they need more work. The percentages of academic and vocational teachers who use various means of measuring student performance are shown in Table 9.3.

Table 9.3
Mean Percent of Student Grades Based on Various Student Performance Measures

Measures	Academic Classes	Vocational Classes		
		All	Comprehensive High Schools	Vocational Schools
Teacher-developed tests	39	24	26	18
Student classwork	15	19	21	12
Performance in school lab or shop	3	17	14	28
Student presentations or projects	10	12	13	9
Attendance and/or class participation	5	8	7	14
Standardized tests	7	6	6	7
Student homework	14	6	6	4
Job performance at worksite	0	3	3	3
Student portfolios of best work	4	2	2	3
Other	2	2	2	3
Total	100	100	100	100

Source: National Assessment of Vocational Education Teacher Survey

Teacher-developed tests account for the largest part of the grades given in both academic and vocational classes. Student classwork, and presentations or projects also play a prominent role in determining students' grades in both kinds of classes. There are, however, marked differences in the extent to which academic and vocational teachers rely on these and other measures.

Academic teachers rely more heavily on tests that they develop and on homework than do vocational teachers, especially those in vocational schools. Homework is less likely to be assigned in vocational than in academic classes and is a relatively small part of students' grades in vocational classes.

Vocational teachers, and especially those in vocational schools, emphasize performance in lab or shop much more than do academic teachers. In fact, in vocational schools such performance is more important than any other measure as a determinant of students' grades .

Standardized tests play a small but significant role in students' grades in all classes. Portfolio assessments are not used much, accounting for only 2 to 4 percent of the grades in all classes.

Problems in Secondary Vocational Education

In assessing vocational education, teachers can provide a valuable perspective on the problems it faces. We asked both academic and vocational teachers for their opinions about problems of **vocational** education in their schools.[10] The percentages of teachers saying that a given item was a serious problem are shown in Appendix Table A-9.3. The problems are rank-ordered from 1 to 14, according to the percentage of teachers who consider them serious.

The rankings are roughly similar for vocational and academic teachers, except in a few areas.[11] The data suggest a specific complex of problems in vocational education. With a single exception, the following are among the top six problems, in the view of these teachers:

1. Inappropriate placement of problem students in vocational education.
2. The status of vocational education in relation to academic subjects.
3. Student motivation.
4. Maintaining vocational enrollments (vocational teachers only).
5. Coordinating vocational and academic instruction.
6. Student absenteeism.

Most of these perceived problems are related, and most are consistent with the view that secondary vocational programs are often used as dumping grounds for students whom the regular schools and programs find difficult to educate (see Chapter 4). A majority of the vocational teachers say that the inappropriate placement of students in vocational education and the status of vocational education are serious problems.

About half of the respondents say that student motivation is a serious problem, and between 40 percent and 47 percent regard absenteeism as serious. (Student discipline is less likely to be regarded as a serious problem, being seen as such by between one-fourth and one-third of respondents.) In short, the teachers seem to believe that the placement of unmotivated, hard-to-teach students in vocational education and the relatively low status of vocational education are the principal problems facing the enterprise.

It seems clear that the teachers' perceptions reflect an underlying reality. As we saw in Chapter 4, the participation of less able students in secondary vocational education is increasing, and this shift may be accompanied by less student motivation and more absenteeism.

CONCLUSION

In some ways, secondary vocational classes resemble academic classes. Lectures, paper-and-pencil classwork, and tests are fairly common in both types of classes. However, vocational courses do place more emphasis on working with equipment, activities related to occupational projects, and performance in class.

To what extent does secondary vocational education serve as a vehicle for academic instruction? The survey data indicate that not much academic work occurs in vocational education. Vocational classes do place some emphasis on basic math (arithmetic, percentages, etc.) and basic reading. However Algebra I, advanced math, and science get very little emphasis. There is some writing, but less than in academic classes. Also, vocational courses have less than half the homework that academic classes have.

Vocational courses tend not to have prerequisites, which maximizes access to them but makes it difficult to develop the coherent sequence of courses that the Perkins Act calls for. Further, although concentrating vocational coursetaking in a program area improves employment outcomes, only about one-half of regular school districts require such concentration to complete a vocational program. In grading decisions, secondary vocational programs, especially those in vocational schools, place considerable emphasis on specific occupational skills and on SCANS workplace competencies, such as teamwork and the ability to use technology. However, the only empirical study to assess SCANS skills finds that most of the workplace competencies are not related to job performance in the industry examined. The SCANS foundation skills, which emphasize academics, thinking, and personal character, are related to job performance in this study.

Secondary vocational education has some strengths and weaknesses in providing students with foundation skills. Its emphasis on self-management and oral communication in grading decisions are strengths. The emphasis given to basic math may be a strength, if the math is not **too** basic. Secondary vocational programs are relatively weak in writing and limited in reading. They are very weak in research and reference skills, which is the only workplace competency related to job performance.

The teachers' responses to questions about problems in secondary vocational education reflect concerns that too many programs have become low-status dumping grounds for special needs students. The findings in Chapter 4 indicate that dumping does occur, but it is worth emphasizing that people may differ about the appropriateness of a student's placement in vocational education. Some vocational teachers may regard the placement of learning-disabled students in their classes as a problem, but Chapter 15 shows that disabled students tend to benefit from secondary vocational education. In this case, placements that teachers consider problematic could nevertheless benefit the students.

ENDNOTES

1 Wirt, J.G., et al. (1989), *National Assessment of Vocational Education, Final Report, Vol. I, Summary of Findings and Recommendations*, Washington, DC: U.S. Department of Education.

2 Section 113 (a) (3) (B).

3 Section 201 (b) (2) (B).

4 Secretary's Commission on Achieving Necessary Skills (1991), *What Work Requires of Schools, A SCANS Report for America 2000*, Washington, DC: U.S. Department of Labor.

5 Because asking teachers to report on a random sample of classes was not feasible, we specified a class taught by our random sample of teachers on a particular school day. This event was "the first class you taught *in your primary* assignment to 9th, 10th, 11th, or 12th graders on October 1, 1992." The particular date was used only to select the classes to be examined. Most of the questions about these classes are general in the sense that they are not limited to events occurring on October 1, 1992.

6 See Anastazi, A. (1982), *Psychological Testing*, New York: MacMillan. Also see Rock, D.A., et al. (1985), *School Quality and Student Outcomes*, Princeton, NJ: Educational Testing Service.

7 The percentages that follow are those of teachers who require homework and who said that they "often" or "always" assign homework of a certain kind.

8 See Secretary's Commission on Achieving Necessary Skills (1991), op. cit.

9 Cappelli, P., & Rogovsky, N. (1993), *Skills and Individual Performance*, Philadelphia, PA: University of Pennsylvania, National Center on Educational Quality of the Workforce.

10 In asking academic teachers about problems for vocational education, we sought a non-vocational perspective to compare with that of the vocational teachers.

11 The rankings are disparate in three areas: (1) the placement of problem students in vocational education is the problem most likely to be considered serious by vocational teachers while it ranks sixth among academic teachers; (2) maintaining vocational enrollments is ranked fourth among vocational teachers and tenth among academic teachers; and (3) vocational student absenteeism is ranked second among academic teachers but sixth among vocational teachers.

PART IV

EDUCATION REFORM AND PROGRAM IMPROVEMENT

CHAPTER 10

THE EFFECTS OF EDUCATION REFORM ON VOCATIONAL EDUCATION

INTRODUCTION

The Perkins Act calls for the National Assessment of Vocational Education to examine "the effect of educational reform on vocational education."[1] The chapter will address this issue in some detail, but first it is important to understand what education reform encompasses and how it is related to vocational education.

Over the years there have been periodic education reform movements. The latter half of this century has seen increased emphasis on mathematics and science, prompted by the Soviets' launching of Sputnik; the movement to create and expand community colleges; the movement toward (and later retreat from) open schools and classrooms; increased attention to the needs of special population students, generated by the broad social movements of the 1960s and 1970s; and more recently, the calls for better education to improve economic productivity.

Recent education reforms began in the early 1980s and have focused on secondary education, prompted by concern about the nation's declining competitiveness in the international market, the relatively poor performance of American students on tests of educational achievement at home and abroad, and complaints from the business community about the low level of skills and abilities found in high school graduates entering the work force.

A recent review of the literature on education reform finds a consensus that there have been two waves of reform since 1980, both focused on secondary education.[2] The first wave, sometimes characterized as academic reform, called for increased effort from the current education system, especially at the secondary level: more academic course requirements for high school graduation, more stringent college entrance requirements, longer school days and years, and an emphasis on standards and testing for both students and teachers. The basic message might be paraphrased, "work more, try harder, strive for excellence."

Beginning in the mid-1980s, a second wave of school reform arose, based in part on the belief that the first did not go far enough to improve education for all students. Sometimes referred to as "restructuring," the second wave called for changes in the way schools and the educational process are organized. While restructuring proposals included school choice and site-based management, of particular interest in this report is the emphasis on improving the school-to-work transition for non-baccalaureate youth by creating closer linkages between vocational and academic education, secondary and postsecondary institutions, and schools and workplaces.

The reform movement — and particularly its first phase — received major impetus from the publication in 1983 of *A Nation at Risk*, the report of the National Commission on Excellence in Education.[3] This influential report observed that the United States was losing ground in international economic competition and attributed the decline in large part to the relatively low standards and poor performance of the American educational system. The report recommended many of the changes that subsequently were enacted in first-wave reforms: the strengthening of requirements for high school graduation, including the requirement of a core academic curriculum; the development and use of rigorous educational standards; more time in school or the more efficient use of presently available time; and better preparation of teachers.

The response to this report and related education reform initiatives was rapid and widespread. One researcher found that between the early and mid-1980s, more than 275 education task forces had been organized in the United States.[4] By the mid-1980s, 43 states had increased course requirements for high school graduation; 17 had developed stronger requirements for admission to state colleges and universities; 37 had created statewide student assessment programs; 29 had developed teacher competency tests; and 28 had increased teacher certification requirements. Between 1984 and 1986, more than 700 state laws affecting some aspect of the teaching profession had been enacted. By 1990 many of these numbers had increased even further.

The next section looks at the prevalence of Wave I and Wave II non-vocational education reforms in states and districts. Subsequent sections of the chapter relate Wave II structural reforms in vocational education to these non-vocational reforms. Because the recent reform movement has focused primarily on secondary education, this chapter deals only with secondary state agencies and secondary districts.

STATE AND LOCAL REFORM EFFORTS

The Omnibus Surveys provide data from administrators in secondary state education agencies, regular school districts, and vocational districts on education reform steps that have been taken in recent years. The proportions of administrators at each level who said that policy changes associated with certain education reform measures had occurred by 1991–92 and the proportions who said that such changes are likely in the near future, mostly in 1992–93, are shown in Table 10.1.[5]

Table 10.1
Education Reform Measures Reported by State and Local Vocational Education Administrators (Percent)

Measure	State		Regular District		Vocational District	
	Occurred by 1992	Likely	Occurred by 1992	Likely	Occurred by 1992	Likely
Wave I						
Increase in academic credits required for graduation	88	10	79	8	87	5
Increase in academic credits required to enter state university	64	10	64	11	66	9
Increase in academic credits needed for teacher certification	48	17	56	15	57	14
Mandate of longer school day	10	19	13	15	8	15
Mandate of longer school year	13	24	19	19	10	17
Proficiency or other exam required for graduation	29	42	38	28	37	37
Elimination of BA in Education in state university system	9	0	5	2	3	8
Wave II						
Relaxation of state administrative rules for local districts	33	35	14	18	13	25
Implementation of site-based management	—	—	34	35	33	36
Establishment of parental choice plan	26	24	18	20	17	28
Elimination of the general track	6	67	16	29	11	46

Source: Omnibus Secondary State Survey and District Surveys, Version B and Vocational

There is substantial consensus among the respondents on these questions. Several first-wave reforms are widespread. These reforms are typically the result of decisions taken at the state level and implemented in the localities. The reforms made by the greatest number of states and districts reflect the first-wave emphasis on higher standards and greater effort, particularly in improving academics.

By 1991–92, the great majority of state and local agencies (79–88%) had enacted policies increasing the proportion of academic credits required for high school graduation, and two-thirds reported increases in the proportion of academic credits required to enter state university systems. About half of the respondents (48–57%) reported mandatory increases in the academic college credits needed for teacher certification. Relatively small proportions reported mandates for a longer school day (8–13%) or a longer school year (10–19%), but those proportions would increase substantially if plans to institute the changes in 1992–93 were carried out.

Another first-wave reform, a requirement for a proficiency or other exam for graduation, seems to occur a little more at the local than at the state level. Virtually the same proportions of regular and vocational districts (37%, 38%) said that such examinations were required in 1991–92, as compared to 29 percent of the states. It may be that some districts have their own examinations for graduation, even though their states do not require them. It is also possible that 29 percent of the states, encompassing approximately 37 percent of the districts, require proficiency examinations for graduation.

The least widespread reform, by all accounts, is the elimination of the bachelor's degree in education in the state university system. The criticism of education departments in colleges and universities by education reformers in the 1980s and the attendant call for the elimination of BA degrees in education seem not to have taken hold.

A significant number of respondents also reported (non-vocational) second-wave "restructuring" reforms that had taken place by 1991–92, and many more administrators reported plans to implement them in the future.

One such reform is site-based management, which involves a downward shift in decision-making and responsibility from states to districts and from districts to schools. By 1991–92 one-third of the state respondents in the survey said their states had relaxed administrative rules for local school districts, giving them greater autonomy and flexibility; another third planned to do so in the following year.

The districts are not as likely as the states to report these changes: Only 13–14 percent said that state administrative rules had been relaxed. Local districts may be less aware than the states are of rule changes that could increase local decision-making power. Alternatively, they may have different perceptions of state actions — a rule change that may seem like a major "relaxation" to a state may seem more like a minor change to localities. Another possibility is that in this instance, one-third of the states encompass about 13 percent of the school districts.

The local counterpart of the relaxation of state control over districts is the loosening of district control over schools. One-third of both the regular and the vocational districts said that site-based management had been implemented in their states or districts by 1991–92, and another one-third indicated that such changes are planned in the future. However, ambiguity in the wording of the question makes these data hard to interpret. We cannot tell whether the changes are at the state or local levels, and hence we cannot conclude that one-third of the districts have site-based management.

Another second-wave reform, school choice, is less widespread than site-based mangement. A little over one-fourth of the state agencies reported that some parental choice plans had been implemented in their states by 1991–92, and another one-fourth said that such plans would be implemented in the future. Somewhat smaller proportions of regular and vocational districts (17–18%) reported the presence of parental choice plans, but as with local site-based management, these district data are difficult to interpret, and should be treated cautiously.

One structural reform reported by the administrators has particular significance for vocational education — the elimination of the general track in secondary schools. There seems to be a growing consensus among educators that general-track education is a poor investment of time and resources. In the absence of other structural changes, the elimination of the general track would route students into either academic or occupational programs. This could have a substantial effect on vocational enrollments, broadening the student base of vocational education and facilitating the development of tech-prep programs.

By 1991–92 only 6 percent of the state administrators reported policy changes designed to eliminate the general track in their states or districts. However, an **additional two-thirds of the states** said that this reform is likely to occur in the future (most said in the next year). If this change takes place as anticipated, almost three-fourths of the states will have adopted reform policies to eliminate the general track within the next several years, with major implications for vocational education.

THE EFFECTS OF EDUCATION REFORM: THE PERKINS ACT

To some extent, the Perkins Act reflects first-wave academic reforms and introduces them into vocational education. In a major way, the Act also encompasses and promotes second-wave structural reforms.

Generally, the Perkins emphasis on improving the academic content of vocational programs seems to reflect the academic emphasis of the first wave. More specifically, the requirement in the Perkins Act that states develop performance standards and measures for vocational education seems to be part of the continuing Wave I reforms, extended to vocational education. The Perkins requirement can be viewed as the vocational counterpart of the state and federal effort, manifest in the National Council on Standards and Testing, to develop standards for academic curricula. [6] Sections 115–117 of the Perkins Act require accountability through core standards and measures of performance, state assessments, and program evaluation and improvement.

Three other important elements in the Perkins Act — the integration of academic and vocational curricula, 2+2 tech-prep programs, and work experience programs — are part of the Wave II restructuring movement. Collectively these three proposed changes are often regarded as key components of the school-to-work transition; they link academic with vocational education, secondary with postsecondary education, and school-based with work-based education. Integration and tech prep can be seen as restructuring responses to *A Nation at Risk*.

Although the idea of learning by doing is an old one, current efforts to integrate academic and vocational education arose largely in response to *A Nation at Risk*. Critics charged that the report was elitist and that it did not place enough emphasis on preparing non-college youth for work. A year after the report's publication, the National Commission on Secondary Vocational Education published its own report, *The Unfinished Agenda: The Role of Vocational Education in the High Schools*.[7] This Commission stressed that secondary academic and vocational education were separate and isolated, denying students the opportunity to understand the "interrelatedness of ideas, the implications and applications of knowledge, and the process of discovery, dissemination, and use of information." The vocational report recommended "bridging the gap" by encouraging secondary vocational education programs to place more emphasis on instructing students in "the basic skills of reading, writing, arithmetic, speaking, listening, and problem-solving."[8]

Tech prep also received major impetus from *A Nation at Risk.* Although the idea of tech prep had been around for a number of years, it was first systematically formulated and widely disseminated in Dale Parnell's *The Neglected Majority*, [9] which was published in 1985, just two years after the report. Like *The Unfinished Agenda*, it reflected a belief that the Commission's work addressed only part of the problem in American education.

At the beginning of the book, Parnell noted that the education reform movement was "led by the clarion call to the American people of *A Nation at Risk*." Parnell asserted that the report was pitched to the one-quarter of American high school students who eventually graduate from four-year colleges and that it ignored the other three-quarters — the neglected majority. In his view, the report "paid scant attention to non-college youth as a target audience or vocational education as a viable part of a school reform strategy."

To provide greater structure, motivation, and continuity for secondary students, especially the non-college-bound students, Parnell proposed that the general track in secondary schools — "the academic and vocational desert of American education" — be eliminated and that high schools be restructured to provide: (a) a college prep program for the top one-quarter of students (in terms of achievement and interest), who are likely to attain baccalaureate degrees; (b) a tech-prep program for the middle two quartiles, leading to a two-year Associate degree; and (c) a vocational program for the lowest quartile of students, leading to a high school diploma and work. Students would choose to enter one of these three programs in the 11th year of school.

Although 2+2 programs had earlier been advocated by organizations such as the Southern Regional Education Board, only a handful of these programs existed in the country at the time Parnell wrote his book.[10] The number of tech-prep initiatives grew rapidly in the latter half of the 1980s: According to Omnibus Survey data, about 40 percent of public two-year postsecondary institutions were beginning to develop tech-prep programs by the 1990–91 school year.

The American Association of Community and Junior Colleges, of which Parnell was executive director, took his message to the Congress to seek federal funds for tech-prep reforms. Over a period of time, such advocacy persuaded the Congress to include the "Tech-Prep Education Act" as part of Title III of the 1990 Perkins Act.

In addition to integration and tech-prep, the restructuring movement included renewed interest in work experience programs such as cooperative education and apprenticeship. Both of these types of programs have long histories. The co-op movement started around the beginning of the 20th century and first received federal support in the 1917 Smith Hughes Act. Apprenticeship, of course, goes back to the Middle Ages in Europe; in the United States it was a common practice in the early years of the republic. Over time it has given way to other forms of training for occupations, but is still found in some trades, especially those in the construction industry.

In the mid-1980s both co-op and youth apprenticeships were promoted by the restructuring movement as work-based alternatives to school-based education that seemed ill-suited to the needs of many non-college-bound students. The restructuring movement adopted and promoted the co-op model without much change. The apprenticeship model, however, took a new form. Traditional apprenticeships were (and are) primarily run by unions and trade associations for younger adults who have completed high school and are in the labor market. The new "youth apprenticeships" are for students in high schools and non-baccalaureate postsecondary institutions and are sometimes coordinated by states in conjunction with reform groups such as Jobs for the Future in Cambridge, Massachusetts.

Although the restructuring reforms in vocational education were stimulated by the first-wave academic reforms, they have developed their own momentum and have prompted legislative or other policy initiatives intended to overhaul secondary education systems in a number of states. Oregon, Wisconsin, Tennessee, Florida, New York, and South Carolina, among others, are embarking on occupationally oriented structural reforms that include (in varying combinations) academic and vocational integration, tech prep, and work experience programs. [11]

At the federal level, the Administration has proposed legislation — the School-to-Work Opportunities Act — that would provide grants to states to plan and develop comprehensive workforce preparation programs. These programs include school-based and work-based components, with links between academic and vocational education (integration); between secondary and postsecondary institutions (tech prep); and between school and work, especially work experience programs such as apprenticeship.

THE EFFECTS OF EDUCATION REFORM: EFFECTS OF NATIONAL AND STATE POLICIES ON LOCAL DISTRICTS

This section examines the relation between a number of national and state education reform efforts, on the one hand, and integration, tech prep, and performance standards in local districts. The national efforts include the Perkins Act, the SCANS[12] report, and National Education Goals. State efforts include state support for integration and tech prep, as well as several of the non-vocational education reforms discussed above.

One of the key questions to be addressed is whether federal and state education reforms have promoted integration, tech prep, and performance standards at the local level. Is there evidence that the Perkins Act, and state efforts in support of the Act, are related to increased implementation of these three initiatives in school districts? Is there evidence that other federal and state reform efforts, such as the SCANS report and increased academic requirements, are related to local reform?

Multiple regression analysis of Omnibus Survey data was used to address these questions. This kind of analysis enables us to examine the relations between an outcome variable and a number of other variables expected to help explain the outcome. The method examines the statistical association between the outcome variable and each explanatory variable, while taking into account the possible effects of all the other variables. Separate regression analyses were conducted on three outcome variables: (a) number of steps taken by districts to integrate academic and vocational education; (b) number of steps taken to develop tech-prep programs; and (c) number of measures used by districts in performance assessment systems.

The explanatory variables for the integration and tech-prep equations included: (a) perceived Perkins influence on integration/tech prep; (b) perceived influence of other national education reforms on integation/tech prep; (c) state support for integration/tech prep; (d) academic reforms; and (e) restructuring reforms. (see Table 10.1 for academic and restructuring reforms.[13] Several school district characteristics were also screened for inclusion in the equation — urbanicity, district size, and proportion of special populations. Of these, only district size was significantly related to the outcome variables and was therefore included in the equation as a control.

The first explanatory variable (a) is an item in the regular district questionnaire. The second explanatory variable (b) is a construct reflecting the mean scores of four highly intercorrelated survey variables (Pearson's $r>.5$, $p<.0001$): the perceived influence of (1) the report to the (Labor) Secretary's Commission on Achieving Necessary Skills (SCANS); (2) the National Center on Education and the Economy report, *America's Choice: High Skills or Low Wages*[14]; (3) the America 2000 initiative; and (4) the National Goals initiative. One score was developed for the influence of these initiatives on integration, another for their influence on tech prep.

The third variable (c) is a construct reflecting the mean scores of two highly correlated survey variables: state support for integration (or tech prep) and state leadership in general. Again, one composite score was developed for integration, another for tech prep.

The fourth variable (d) is also a construct reflecting the mean scores of two highly correlated survey variables: increase in the proportion of academic credits needed to enter the state university system and increase in academic college credits needed for teacher certification(Pearson's $r=.44$,$p.<.001$). The same variable is used in the integration and tech-prep equations.

The fifth variable (f) is the relaxation of state administrative rules for local districts. The same variable is used in both equations.

Fewer explanatory variables were available for the analysis of factors related to performance standards. They included (a) state support for performance standards; (b) academic reforms; (c) restructuring reforms; and (d) district size.[15] Table 10.2 shows the result of these analyses.

Table 10.2
Factors Associated With Integration, Tech Prep, and Performance Standards

Dependent Variables:	Steps to Integrate		Steps to Develop Tech Prep		Number of Performance Measures Used	
	Coefficient	p<	Coefficient	p<	Coefficient	p<
Independent Variables						
Perkins influence	.33	.0016	.51	.0014	—	—
Other national reforms	.44	.0134	.34	.1345	—	—
State support	.77	.0001	.15	.6032	1.21	.0003
Academic reforms	.55	.0535	.71	.1095	.78	.1021
Restructuring reforms	.26	.0406	.45	.3402	.12	.8244
District size	.15	.0840	.49	.0001	.62	.0001
R^2	.19		.17		.07	

Source: Omnibus District Survey, Version B

The perceived influence of the Perkins Act is significantly related to the number of steps (listed in the survey) that districts take to integrate their academic and vocational curricula and to develop tech-prep programs. Districts that report a large Perkins influence have taken 1.0 more steps to integrate (out of a possible ten) and 1.5 more steps to develop tech-prep programs than those that report no Perkins influence.

Other national education reforms, such as SCANS and the National Goals, are significantly related to academic/vocational integration, but not to tech prep. Districts that say these reform initiatives have had a large influence on their integration efforts have taken 1.3 more steps to integrate their curricula than those that report no influence. The level of significance for this association is not as high as that for the Perkins Act ($p<.0134$, $p<.0016$).

State support for reforms is strongly and significantly related to integration and performance standards, but not to tech prep. Districts that say they have very good state support for integration have taken 1.5 more steps to integrate than those saying they have little or no support. Districts reporting very good state support for performance assessment are using 2.4 more performance measures than those with little or no support.

Academic and restructuring reforms are related to integration at borderline significance levels, ($p<.0535$, $p<.0406$) but not to tech prep and performance standards. District size is marginally related to integration but strongly related to the development of tech prep and performance standards.

In general, the Perkins Act seems to affect local reform efforts significantly. Other national initiatives appear to have some, more limited effects at the local level. Independent of the Perkins Act and other national reform initiatives, state support for reform seems to have substantial impacts on integration and the development of performance standards. The absence of any relation between state support and tech prep suggests that tech-prep grants may be seen as arrangements between the federal government and local districts, with the states serving as intermediaries.

THE EFFECTS OF EDUCATION REFORM: IMPACT ON VOCATIONAL ENROLLMENTS

In Chapter 4 we saw that enrollments in secondary vocational education are continuing a decade-old decline. Vocational educators think that the decline is partly the result of education reforms, especially increased academic requirements for graduation, which reduce the time available for electives such as vocational education. This section of the chapter will examine that argument. In part, declining vocational enrollments were a function of the smaller student birth cohorts in the late 1970s and the 1980s. Around 1990, total secondary school enrollments began to increase as the children of the "baby boom" generation started to enter high school. However, vocational enrollments continued to decline. The pattern of increasing general enrollments and decreasing vocational enrollments was also evident in 1992.[16]

If the present pattern continues, decreasing enrollments will drain resources away from vocational programs, and they will lose their vitality. Therefore it is important to go beyond examining the effects of academic reforms on vocational enrollments to look at the possible effects of other factors, as well. In particular, decision makers will find it useful to know what policy-relevant factors are associated with **increased** vocational enrollments, because these factors may present opportunities for policy changes beneficial to vocational education and the students who participate in it. This section will examine the contribution of such factors to increased enrollments.

Effects of Academic Reform on Vocational Enrollments

First, let us address the question of the impact of academic reforms. Are increases in academic requirements for graduation and for college entrance causing vocational enrollments to decline? The respondents in our community case studies certainly think so. The case study summary notes that:

> It is the nearly unanimous opinion of all types of respondents that the cumulative effect of these [reforms] has been to diminish the stature of vocational education, its offerings, and its students.[17]

Opinion data from the Omnibus Surveys also support this view (Table 10.3). State administrators think that education reforms have had a marked and largely negative effect on enrollments and offerings in vocational education: 71 percent say that total vocational enrollments have decreased as a result of the reforms; 66 percent say that the number of vocational courses has decreased; and 77 percent say that the number of vocational teachers has decreased. A smaller but still substantial proportion (44%) say that the reforms have reduced the variety of vocational course offerings.

Vocational district administrators also tend to think that education reforms have caused enrollments to decrease, but the proportion who do (60%) is somewhat smaller. The proportion of regular district administrators who perceive this effect is smaller still (45%). The opinions of vocational and regular district administrators may reflect their first-hand experiences of enrollment decreases. As we saw in Chapter 4, vocational districts are more likely than regular districts to report substantial decreases in enrollments over the five years preceding 1991–92.

However, seeing these decreases and knowing that they are the result of education reforms are two different things. Using data from the Omnibus Surveys, we can address this question by examining the statistical relations between the education reforms described above and changes in vocational enrollments. In the survey, administrators in regular school districts were asked to indicate which reforms in a list were implemented between 1987 and 1992. Elsewhere in the questionnaire they were asked to indicate the extent of change in vocational enrollments in the same time period. Appendix Table A-10.1 presents Pearson correlation coefficients and levels of significance for the association between each reform variable and administrators' reports of changes in vocational enrollments in their districts. A correlation of 0.0 means that there is no relation between two variables; a correlation of 1.00 is a perfect association, in which every change in one variable is matched by an identical change in the other.

As the table shows, there are few significant associations between the education reforms listed and changes in vocational enrollments, and those that exist are weak. Specifically, there is no significant relation between increases in the proportion of academic credits required for graduation and changes in vocational enrollments between 1987 and 1992. There is a significant but weak association between enrollment changes and increases in the proportion of academic credits needed to enter state university systems. However, the association is positive, suggesting that to the extent these university entrance requirements had any effect, it was to increase rather than decrease vocational enrollments.

Table 10.3
Perceived Effects of Education Reforms on Vocational Education (Percent)

	State		Regular District		Vocational District	
	Increase	Decrease	Increase	Decrease	Increase	Decrease
Total district enrollment in vocational education	16	71	21	45	19	60
Enrollments at area vocational schools	17	46	26	31	—	—
Enrollment of disabled students in vocational education	56	2	33	6	58	2
Enrollments of educationally disadvantaged students in vocational education	63	2	38	9	66	4
Total number of vocational course offerings	19	66	29	33	20	40
Variety of vocational course offerings	31	44	35	28	22	30
State funds for vocational education	29	27	18	43	19	55
Integration of vocational and academic education	77	0	54	5	75	2
Articulation between secondary and postsecondary vocational programs	87	0	60	2	80	1
Vocational education opportunities at the middle school level	45	15	26	14	18	16
Number of vocational teachers	10	77	13	36	15	46
Quality of teaching in vocational education	62	12	43	7	59	11

Source: Omnibus Secondary State Survey and District Surveys, Version B and Vocational

Longer school years and site-based managment programs are also positively associated with enrollment changes, while parental choice plans are negatively associated with them. There is a slight tendency for school districts that have longer school years and site-based management to have increased vocational enrollments, while districts with parental choice plans tend to have slightly decreased enrollments. Once again, however, these associations are weak and difficult to interpret.

On the whole, the analysis provides no substantial evidence that increased academic requirements caused vocational enrollments to decline between 1987 and 1992.

Viewing all the data — from the case studies, survey opinions, and statistical analyses — it is hard to reach any firm conclusion about the effects of educational reform on vocational enrollments. The statistical analyses contradict the opinion data in the surveys and case studies. The statistical analysis is straightforward, and the data on which it is based seem sound. Ordinarily this would be enough to conclude that there was no such effect between 1987 and 1992.

However, it would be ill-advised to dismiss the opinion data. In the case studies especially, there is detailed information showing that more able students are now choosing academic rather than vocational courses in order to meet new, higher college entrance requirements. We are left with the impression that the increased emphasis on academics has reduced vocational enrollments. Whether specific reforms such as increased graduation requirements are responsible for the shift away from vocational education or whether secondary students are choosing more academics for other reasons is still unclear.

CAN REFORMS IN VOCATIONAL EDUCATION IMPROVE ENROLLMENTS?

The Omnibus Survey data also enable us to address questions such as the following: Are Perkins reforms at the district level related to changes in enrollments? Is there any relation between other federal reform initiatives and vocational enrollments? Does state support for Perkins reforms affect enrollments? What effect, if any, do local program improvement efforts have? What effect do problems in vocational education have on enrollments?

The correlation coefficients and related significance levels for an array of variables that might have an impact on vocational enrollments are shown in Table A-10.2. The correlation analysis will be used to screen these "candidate" explanatory variables for inclusion in multiple regression analyses designed to explain changes in vocational enrollments. Several categories of variables related to changes in vocational enrollments will be examined: district demographics, Perkins reforms, state support for Perkins reforms, federal impact on education reforms, program improvements, and problems in vocational education.

District Demographics

Among the district demographics, we would expect the reported change in total student enrollments 1987–1992 to be the factor most strongly related to change in vocational enrollments, and the survey data confirm this expectation. As noted above, however, total enrollments began to increase around 1990, while vocational enrollments were still declining, and the pattern continued at least into 1992. Increased total enrollments are apparently slowing the decline of vocational enrollments.

Other district demographic characteristics show weak associations with enrollment changes. Vocational enrollments in larger, urban districts are slightly more likely than those in other districts to be declining, while enrollments in districts with higher proportions of special populations are slightly more likely to be increasing. These associations may seem contradictory, since larger urban districts also tend to have higher proportions of special populations, but the associations are weak and are not inconsistent with the way urbanicity and special populations are distributed. In particular, many rural districts also have high proportions of special populations.

Perkins Reforms

Because they are intended to improve vocational programs, Perkins reforms should help increase enrollments. The survey data suggest that they do, although the maxim that association does not equal causation should be kept in mind. Two of the three major Perkins reforms are associated with increasing enrollments in districts. The number of steps districts had taken to integrate academic and vocational education by 1991–92 and the number of performance measures in place by that time are positively related to enrollments in this correlational analysis. Districts that are more active in integrating and in developing performance measures are more likely than others to have increasing enrollments. Of the two, integration is more strongly associated with increasing enrollments. The number of steps taken to develop tech-prep programs is not significantly associated with changes in vocational enrollments.

State support for Perkins reforms and state leadership are strongly and positively related to vocational enrollments, as expected. Of all the state variables, the one most strongly related to enrollment changes is "state leadership in general." Districts that report good leadership from their states are substantially more likely than others to have increasing enrollments.

Determining whether federal reform initiatives have any relation to vocational enrollments is an indirect process. The available measures are district administrators' estimates of the influence of four federal education initiatives on local efforts to integrate academic and vocational education and to develop tech-prep programs. The four federal reform initiatives are the Perkins Act, the SCANS report, the America 2000 initiative, and the National Goals initiative.

Fairly strong positive associations between student enrollments and the perceived impacts of America 2000 and the National Goals initiative on tech prep are shown in Table A-10.2. The table also shows weaker but still significant associations between vocational enrollments and the perceived impact of the Perkins Act and the National Goals initiative on integration. Districts that are influenced by these federal reform initiatives tend to have increasing enrollments.

We would expect any effects of federal and state reform activities on vocational enrollments to be indirect — that is, federal and state initiatives affect local education systems, which in turn affect vocational enrollments. This hypothesis will be tested later when we examine some of the correlates of vocational enrollments in multivariate analyses.

Local Program Improvements

We expect local program improvements to be positively associated with vocational enrollments, and the data support this expectation. A number of program improvements in the 1987–1992 period are positively associated with vocational enrollments, and in some cases the associations are fairly strong.

Districts that added career exploration programs, those that added student leadership programs such as Future Farmers of America and Distributive Education Clubs of America, and those that added job placement activities in the five years prior to the survey showed a definite tendency toward increased vocational enrollments. Those that added general or vocational skills training, those that added cooperative education or work experience programs, and those that added assessments of vocational interests and abilities also showed significant increases in vocational enrollments. Other weaker associations were also significant.

Problems in Vocational Education

Finally, we expect problems in vocational education to be negatively associated with changes in vocational enrollments: The more serious the problems, the less likely students would be to enroll in vocational education. In the survey, district administrators rated the seriousness of 12 problems often encountered in vocational programs. We found that in all cases the seriousness rating was negatively related to vocational enrollments.

For four problems, the associations with vocational enrollments were statistically significant. Districts in which the image of vocational education among parents and students was a serious problem, those in which vocational education's image in the business community was a serious problem, and those which had a serious problem finding funds for vocational classroom support tended to be districts with declining enrollments. There was a weaker but still significant association between declining enrollments and problems in recruiting special needs students to vocational education.

Interpreting the Correlations

In interpreting these data it is important once again to remember that statistical associations do not prove causality, they merely indicate relationships. Knowing that A is related to B is not the same as knowing that A causes B. B may cause A; or C, which is related to A, may cause B, and so on. Do fewer students enroll in vocational education because districts have a problem finding funds for vocational classroom support? Or do districts have a problem finding funds because fewer students are enrolling? Do students stay away from some vocational programs because the programs have a poor image? Or do low enrollments contribute to the poor image of those programs? Or is there something else about the programs that both gives them a poor image and causes students to stay away?

One way to help sort out such questions is to use multivariate analysis, which examines the relation between each explanatory variable and enrollment changes, taking other possible explanations into account. While this approach cannot definitively establish a causal relation between A and B, given the type of data available, it can isolate the relation between A and B, independent of C.

Multivariate Analysis of Factors in Vocational Enrollments

Having screened candidate variables that might help explain changes in vocational enrollments, we included the most promising variables in a multiple regression analysis. The outcome variable was changes in vocational enrollments 1987–1992. The explanatory variables, selected from among the candidates, were the ones most strongly associated with enrollment changes in the correlation analyses — those having a coefficient of at least .18 and a statistical significance level of $p<.0001$. Each of the major categories examined above (district demographics, Perkins reforms, etc.) had at least one such variable. The results of this analysis are shown in Table 10.4.

Change in total student enrollments is the most important predictor of change in vocational enrollments, and in this case a causal relation can be assumed with some confidence.

Among the policy variables, one Perkins reform — the number of steps taken to integrate academic and vocational education programs — is also significantly related to enrollments. The more steps districts take to integrate their programs, the higher their vocational enrollments. Since the survey measures change in

Table 10.4
Multiple Regression Analysis of Factors Related to Vocational Enrollments in Regular School Districts

	Regression Coefficient	Significance Level p<
Changes in total student enrollments	.43	.0001
Number of steps taken to integrate	.07	.003
State support for integrated programs	.17	.05
State support for assessment and accountability	-.09	.35
State leadership in general	.14	.18
Perceived effect of America 2000 on tech-prep efforts	.05	.46
Added career exploration	.30	.0008
Added student leadership programs	.31	.0013
Added job placement activities	-.07	.44
Problem with image of vocational education among students and parents	-.15	.002
$R^2 = .42$		

Source: Omnibus District Survey, Version B

vocational enrollments by categories rather than by continuous numbers, we cannot say exactly how much change in enrollments is related to integration. However, we can say that **at a minimum**, each additional step taken to integrate is associated with a 1.4 percent increase in vocational enrollments.[18] Since there are ten steps listed in the survey, a shift from no integration to full integration is associated with an increase of at least 14 percent in vocational enrollments.

One plausible interpretation of these data is that integrated programs have drawing power. They may be more interesting to students who usually do not take many vocational courses. They may also have holding power in the sense that students who take one occupational course will be more interested in taking the next. It is more difficult to turn the explanation around — there is no obvious reason why increased vocational enrollments should cause districts to integrate their curricula. Nevertheless, other explanations for this association are possible and should not be discounted.

Information from the case studies support this interpretation. In the case study sites, the more rigorous applied academic courses, and especially Principles of Technology, are popular and tend to attract higher achieving students who would not ordinarily take vocational education. (It should be added, though, that "PT" is often not counted as a vocational course.)

State and federal reform activities appear to have no direct effect on vocational enrollments. State leadership, state support for assessments, and perceived effects of America 2000 are not significantly associated with enrollment changes when the other factors are taken into account. State support for integrated programs shows a barely significant association with enrollments, but on the whole there is little evidence of independent effects. These findings support the hypothesis that state and federal reform initiatives foster changes in school districts, and these changes, in turn, tend to increase vocational enrollments.

Local program improvements continue to show significant positive associations with vocational enrollments, even after other factors are controlled. Adding or expanding career exploration programs and adding or expanding student leadership programs are each associated with a minimum 12 percent increase in vocational enrollments. On the other hand, the addition of job placement activities is not significantly related to enrollments after other factors are controlled. These findings suggest that some local program improvements may help increase vocational enrollments, although other interpretations are possible.

Finally, it is no surprise that the image problem is significantly and negatively related to vocational enrollments. As the problem becomes progressively more serious, enrollments go down. A change from no problem to a serious problem is related to a minimum 9 percent enrollment decrease.

In all, the correlations and regression analyses suggest that the districts with weaker vocational programs are losing vocational enrollments and those with stronger programs are gaining them. The data also suggest that improving programs and adopting some of the Perkins reforms may help to improve vocational enrollments.

CONCLUSION

Beginning in the 1980s, American secondary education underwent two waves of reform. The first wave, set forth in *A Nation at Risk*, focused on the improvement of academics and implicitly on college-bound students. The second wave, called "restructuring reform," was in large part a response to the perceived shortcomings of the first. Many, but not all, second-wave reforms focused on preparing non-college-bound youth for occupations and careers.

The Perkins Act's requirement for performance standards is part of the first wave of reform. The Act's emphasis on integration, tech prep, and work experience programs is part of the second wave. Together, these three innovations are key elements in the "school-to-work transition."

The movement to promote occupationally oriented second-wave reforms is spreading. A number of states have adopted school-to-work transition policies and are implementing them in secondary schools. At the federal level, the Administration has prepared the School-to-Work Opportunities Act, which is currently being considered by Congress.

Multivariate analysis suggests that the Perkins Act is effective in promoting integration and tech prep in local districts. Independent of the Perkins Act, state agencies seem to be effective in promoting integration and performance standards: Districts that say they receive strong support from their states tend to be more active in integrating and in developing performance standards.

One often debated question about education reform is its effect on vocational enrollments. Vocational administrators believe that the Wave I reforms, and especially increased academic requirements for graduation, have reduced vocational enrollments by reducing the amount of time available to students for electives. Our case study researchers also reported this effect. However, statistical analysis of Omnibus Survey data shows no relation between increased academic requirements and changes in vocational enrollments between 1987 and 1992. The findings on this issue are conflicting, and unfortunately there is no clear answer to the question.

However, some Wave II reforms and program improvement efforts are associated with increased vocational enrollments: (a) the integration of academic and vocational education, (b) increased state support for integration; (c) career exploration programs, and (d) student leadership programs. The evidence is consistent with the hypothesis that reforms and improvements such as these can help increase vocational enrollments.

ENDNOTES

1 Section 403 (b) (5) (A).

2 The discussion of the recent history of education reform draws heavily on M. Asche, et al. (1993), *The Impact of Educational Reform on Vocational Education*. Draft report prepared for the National Assessment of Vocational Education. Berkeley, CA: National Center for Research on Vocational Education.

3 National Commission on Excellence in Education (1983), *A Nation at Risk: The Imperative for Educational Reform*, Washington, DC: U.S. Department of Education.

4 Chance, W. (1988), *The Best of Educations*. Denver: Education Commission of the States, cited in Asche, et al.

5 Apart from reforms existing in 1991–92 or planned for the future, a third response option, indicating that a reform had not occurred and was not likely to occur, is omitted from this table. If it were included, the three columns would total 100%.

6 The National Assessment's recent literature review on education reform notes that the provision for core standards and measures "incorporates the outcomes accountability concept inherent in the earlier standards and testing reform initiatives but also reflects awareness of the latter [restructuring] reforms in that localities are guaranteed the opportunity to modify and adapt state-developed core standards and measures to local needs and conditions." (The restructuring lies in the devolution of responsibility from the states to the localities.) See Asche et al. p. 22.

7 This discussion of *A Nation at Risk* and the subsequent report of the National Commission on Secondary Vocational Education draw upon a report by N.E. Aldelman. (1989), *The Case for Integrating Academic and Vocational Education*, p. I-2. Washington, DC: Vocational Education Analysis and Support Center.

8 The National Commission on Secondary Vocational Education (1984), *The Unfinished Agenda: The Role of Vocational Education in High School*. Columbus, OH: National Center for Research in Vocational Education.

9 Parnell, D. (1985), *The Neglected Majority*, Washington, DC: Community College Press.

10 See Parnell, pp. 120–22.

11 See General Accounting Office (1993), *Transition from School to Work: States are Developing New Strategies to Prepare Students for Jobs*, Washington, DC, (GAO/HRD-90-88, May 11, 1993). Also see Hayward et al. (1993), *A Literature Review for Tech Prep*, p. 20, Berkeley, CA: National Center for Research in Vocational Education.

12 Secretary's Commission on Acquiring Necessary Skills (1991), *What Work Requires of Schools*. Washington, DC: U.S. Department of Labor.

13 A number of "federal" and "state" variables expected to be related to the implementation of integration, tech prep, and performance standards were correlated with these outcome variables and with each other. Those strongly and significantly related to the outcome

variables were selected for inclusion in the regression analyses. First, however, independent variables that were strongly inter-correlated were combined into single variables.

[14] National Center on Education and the Economy (1990), *America's Choice: High Skills or Low Wages*, Rochester, NY: Author.

[15] The state support and academic reform variables in the performance standards equation were constructed in the same way as those for integration and tech prep.

[16] The General Accounting Office found this pattern in analyzing data for its report on secondary vocational education, *Vocational Education: Status in School Year 1990–91 and Early Signs of Change at the Secondary Level* (GAO/HRD-93-71, Washington, DC 1993). Personal communication with Tom Hubbs, October 1993.

[17] Milne, A., Martindale, M., & Michie, J. (1993), *Vocational Education in Communities*, p. 12. Rockville, MD: Westat.

[18] The regression coefficient (.07) applies to each of four one-point increments on a five-point scale. Each increment equals at least a 5% change in enrollments. Thus, 4 (.07) (.05)=.014.

CHAPTER 11

PERFORMANCE STANDARDS AND MEASURES

INTRODUCTION

The 1992 Omnibus Surveys provide a snapshot of state and local agencies in the process of developing statewide systems of standards and measures of performance. Such systems were mandated by the 1990 Perkins Act, which envisions an accountability system built around outcomes, measures, and standards. Outcomes are student- and program-level accomplishments, including the mastery of academic and occupational skills, the completion of programs, and employment. Measures are ways of quantifying the attainment of outcomes, such as written examinations, scored performance exercises, and rates of placement. Standards are targets of acceptable performance on each measure, including both absolute levels ("greater than 75 percent of students") and rates of improvement over time. The Perkins Act requires states to adopt a common set of standards and measures of performance to serve as a framework for evaluating and improving programs.

Although the legislation was enacted in 1990, states were given two years to prepare for changes in accountability; they were not required to implement systems of standards and measures until the fall of 1992.[1] When the Omnibus Surveys were distributed in the spring of 1992, most states were still in the process of developing their plans. Many had not yet decided which measures to use, nor had they set standards for performance.

As a result, many of the questions in the surveys covered multiple time periods. Respondents were asked to describe their efforts prior to the survey (before school year 1991–92), at the time of the survey (during school year 1991–92), and subsequent to the survey (their intentions for 1992–93 when final standards would be in place).

This chapter is divided into three sections. The first focuses on the process of implementation. The second analyzes the **nature** of the changes that states, districts, and schools are making as they adopt performance measures and standards. The final section draws together our conclusions for the broad questions of vocational education policy.

THE PROCESS OF IMPLEMENTING STANDARDS AND MEASURES OF PERFORMANCE

This section uses Omnibus Survey data to address four questions about the process of implementation:

- Are the states responsive to the Perkins requirements for establishing standards and measures?
- How much attention is being paid to implementing standards and measures at the local level?
- What kinds of states are most active in establishing standards and measures?
- What groups are most heavily involved in developing state standards and measures?

State Progress

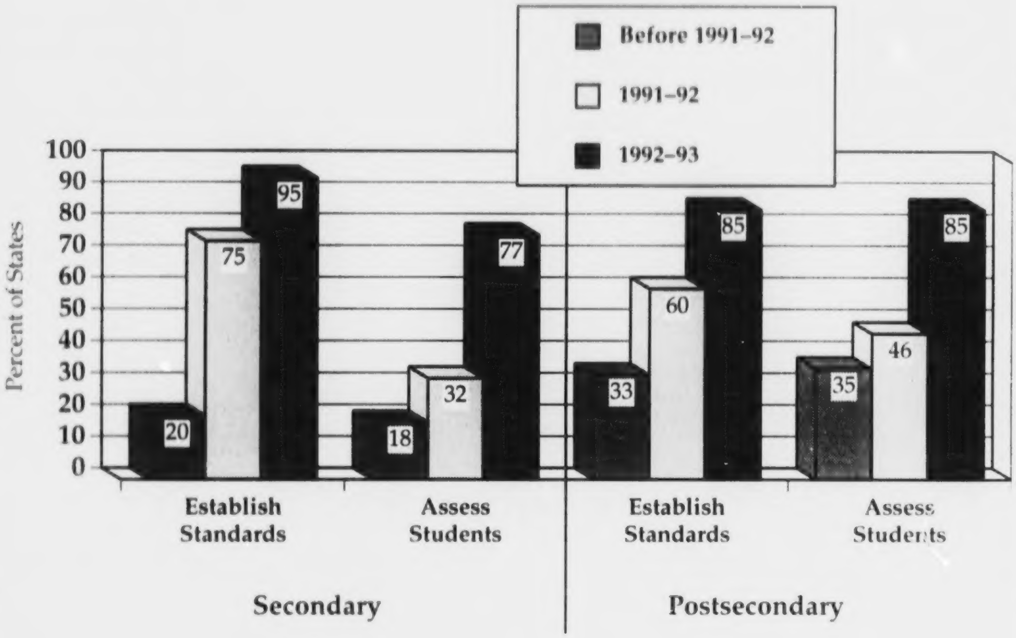
The survey data show that states are responsive to the Perkins requirements. By Spring 1992, virtually all states were in the process of developing performance standards. Eighty-five percent or more of state secondary and postsecondary agencies reported that they will have established performance standards for vocational education by the end of the 1992–93 school year. Over three-quarters of the states are assessing, or plan to assess, secondary student performance based on these standards; before 1991–92, only 18 percent of the states did so. At the postsecondary level, 85 percent of the states expect to use standards-based student assessment by 1992–93, up from 35 percent in 1991–92. (See Figure 11.1.)

The increased use of standards-based assessment could be one of the most significant Perkins-inspired changes in state accountability practices. However, there is a significant gap between what states planned for 1992–93 and what was accomplished by the end of 1991–92. It is possible that in providing the survey data, states were overly optimistic about meeting Perkins requirements in the following year (see Appendix Tables A-11.1 and A-11.2).

The Perkins Act has clearly encouraged states not only to develop performance standards but to pay more attention to the types of measures they use, or will use, to monitor statewide performance. By the end of the 1992–93 school year, 85 to 95 percent of state secondary and postsecondary agencies plan to have engaged in the process of selecting and/or developing performance measures.

Moreover, by the end of the 1991–92 school year, more than two-thirds of secondary and postsecondary state agencies were developing new performance

Figure 11.1
Steps in Implementing Standards



Source: Omnibus Surveys of Secondary and Postsecondary State Agencies

measures, rather than simply adjusting or recycling measures that had already been in use. In contrast, before 1991–92 only one-third of the states were involved in developing new performance measures, while roughly one-half were selecting from existing performance measures (see Chapter 3 and Appendix Table A-11.1 and A-11.2).

This increase in state performance assessment activity has placed an increased burden on state officials. Nearly 80 percent of the states report that secondary and postsecondary vocational education staff have more responsibilities for developing measures of student performance than they did in 1990 (see Appendix Table A-11.3).

Local Implementation

While states have made a strong commitment to developing statewide standards and measures, implementation had not begun in earnest at the time of the survey. Presumably for this reason, responses from secondary school districts (both comprehensive and vocational) indicate no increase in attention to implementing vocational performance standards and measures at the local level.

Less than one-third of the surveyed school districts, regular and vocational, reported any increase in state assistance with assessment or accountability. On a similar question, only 40 percent of the regular secondary districts and one-half of the vocational districts said there had been any increase in state support for vocational program assessment and accountability since the previous school year (see Appendix Tables A-11.4 and A-11.5).

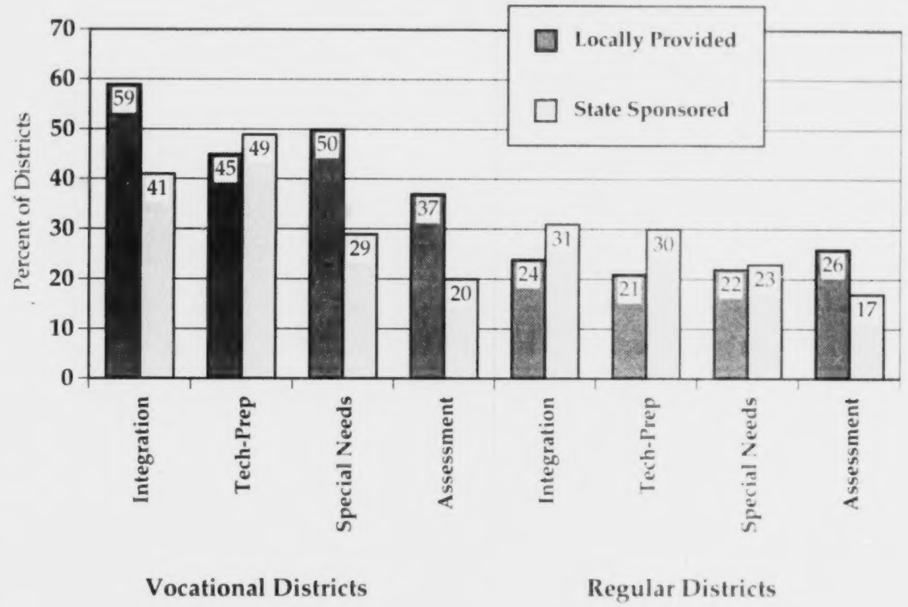
Many districts feel comfortable with this level of effort. Slightly less than one-half of the regular school districts and 62 percent of vocational school districts feel that state support for vocational program assessment and accountability is very good or adequate.

While implementing new statewide performance measures and standards in vocational education is likely to affect teachers, at the time of the survey few had yet received any training relating to performance assessment. In 1991–92, less than 20 percent of vocational and regular districts reported any state-sponsored in-service programs on "student assessment/performance evaluation" for vocational education teachers. States were much more likely to have sponsored reform-oriented in-services on topics such as the integration of vocational and academic education, tech prep, and services for special needs students. One-quarter of regular school districts and one-third of vocational districts sponsored their own in-service on student assessment (see Figure 11.2; see Appendix Tables A-11.6 and A-11.7).

With little or no state guidance, most school districts and postsecondary institutions seem to be waiting to see how their state's plan will affect them. Only 11 percent of regular school districts used 1991–92 Perkins Title II basic grant funds to develop or expand vocational performance assessment systems; slightly more than one-quarter of all vocational districts used Title II funds for this purpose. In both types of districts, performance assessment was among the rarest funding choices. Only 19 percent of postsecondary institutions used 1991–92 Perkins Title II basic grant funds to develop or expand vocational performance assessment systems; once again assessment was among the least frequently funded activities (see Appendix Tables A-11.8 and A-11.9).

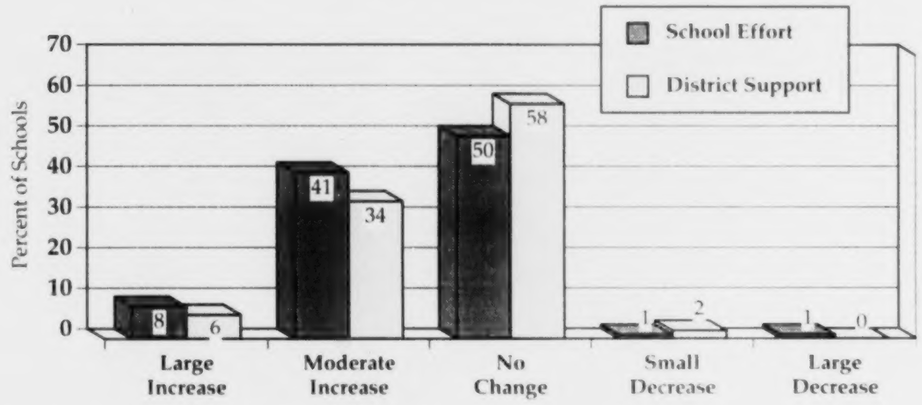
Responses to other questions also indicated that the influence of state standards and measures at the secondary school level is limited. One-half of the secondary schools reported no change in assessment and accountability efforts over the previous year; 41 percent reported a moderate increase in such efforts and 8 percent a large increase. The majority of high schools experienced no change in district support for vocational program assessment and accountability, but 40 percent did report a moderate or large increase (see Figure 11.3).

Figure 11.2
District In-Service Topics



Source: Omnibus Surveys of School Districts

Figure 11.3
Changes in District Support for Assessment and Accountability 1990–91 to 1991–92



Source: Omnibus Survey of Secondary Schools

Adoption Patterns

At the secondary level states appear to adopt Perkins-related reforms as a package, rather than one at a time. In addition to requiring the implementation of statewide systems of performance standards and measures, the Perkins Act also requires states to move forward with other reforms such as integrating academic and vocational programs, developing tech-prep programs, and providing services to special populations.

States that were more aggressive [2] in promoting integration of academic and vocational education also tended to begin developing and using performance standards and measures at the secondary level earlier than less aggressive states. The most aggressive promoters of academic/vocational integration were eight times more likely to have assessed student performance, using standards at the secondary level in 1991–92, than the least active integrators (54 % to 7%, respectively). In other words, states that had done more with integration at the secondary level are doing more with performance standards and measures (see Appendix Table A-11.10). While there is some evidence of a similar relationship at the postsecondary level, the association is weaker.

Some evidence suggests that states with higher public expenditures for vocational education also are more active in implementing performance standards and measures at the secondary level. However, this relationship is not as strong, and the pattern is not consistent in the secondary and postsecondary data.

Key Players

The most important groups in developing statewide systems of standards and measures are state and local vocational education administrators and staff. State vocational education officials, school administrators, and local vocational education administrators and staff played regular or major roles in developing standards and measures in more than 70 percent of the states, at both secondary and postsecondary levels. Special population representatives were the only "outsiders" involved to this degree in the development process. (See Chapter 6.)

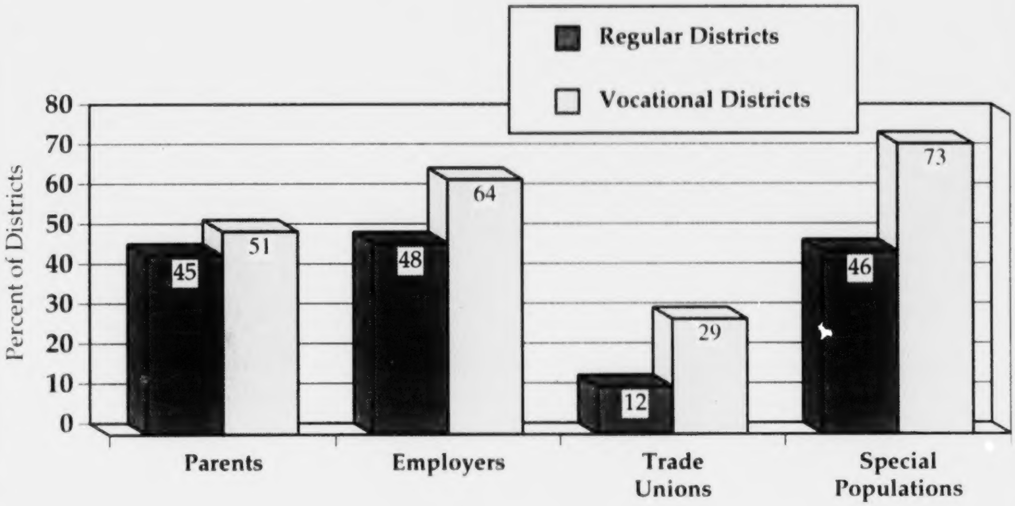
At the secondary level, employer representatives, parents, and students were consulted, at least once or twice, in 80 to 90 percent of the states. These same groups were involved much less often at the postsecondary level. Union representatives were involved in some way at the secondary level in two-thirds of the states. However, they were involved at the postsecondary level in just under one-half of all states (see Appendix Table A-11.11).

In most cases there is no relationship between the groups involved in the process of developing performance measures and standards and either the level of state expenditures on vocational education or the state's aggressiveness in promoting integration of academic and vocational education. The only exception is the participation of state legislators. At both secondary and postsecondary levels, states that had done more to promote vocational/academic integration were also more likely to at least occasionally consult state legislators or staff in this process (see Appendix Table A-11.12).

As one might expect, local school officials appeared to know little about who was involved in developing statewide performance measures and standards. The survey response rate was very low when district officials and postsecondary institution representatives were asked about the involvement of local groups in the **state** standards and measures developing process.

District officials were much more knowledgeable about the input of various groups in the process of developing their own **local** plan. Vocational school districts were much more likely than regular school districts in involve parents, employers, trade unions, and representatives of special populations in developing their local plan. None of these groups were involved in even one-half of the regular school districts. Parents, employers, and special population representatives were involved in local plan development in more than 50 percent of the vocational school districts. (See Figure 11.4.)

Figure 11.4
Groups That Helped Develop Local Plans



Source: Omnibus Surveys of School Districts

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THE NATURE OF THE NEW STANDARDS AND MEASURES OF PERFORMANCE

The Omnibus Survey data provides evidence about the nature of states' intentions regarding statewide standards and measures. The survey assembled information to answer three questions:

- What types of performance measures and standards are being adopted?
- Which groups of students will be included in statewide systems?
- How do new measures and standards compare with past practices?

State Adoption of Standards and Measures

Most states intend to use a far greater number and variety of measures than the minimum required in the Act. On average, state directors report using or planning to use 11 of the 17 measures listed in the survey in their statewide systems in 1992–93, and they report little difference between the number of measures to be used at the secondary and postsecondary levels. Measures can be grouped into six general types (consistent with the categories used in the Act); more than 80 percent of the states intend to include at least five of the six types of measures in their systems (see Figure 11.5).

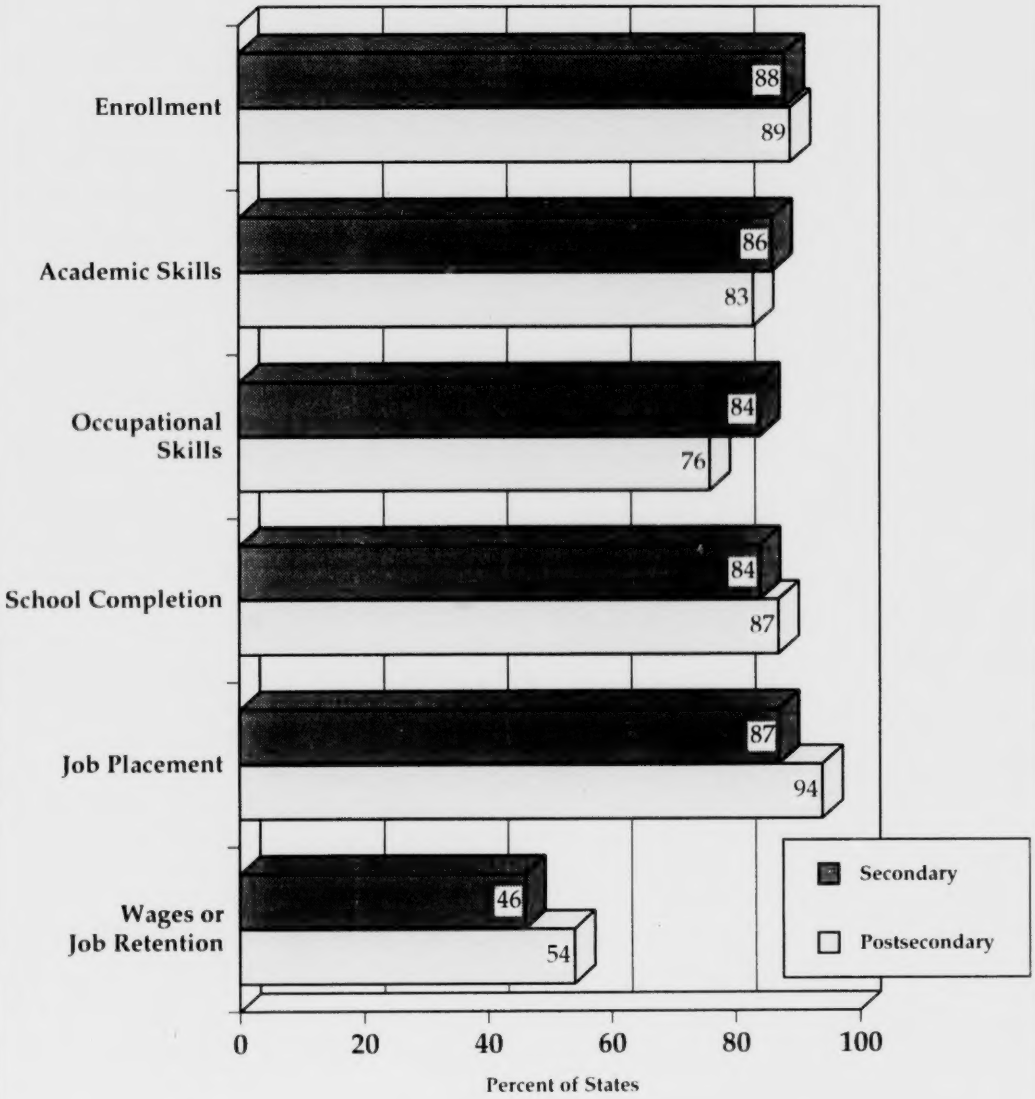
A separate question on measures of labor market outcomes reveals that approximately one-half of the states also use or intend to use measures of employer satisfaction in addition to those measures reported above. (See Appendix Tables A-11.13 and A-11.14 for data on the broad range of outcome measures, and Table A-11.15 for data regarding additional measures of labor market outcomes.)

State progress in adopting statewide standards and measures can also be described in terms of changes in the use of measures. Figure 11.6 shows the increase from 1991–92 to 1992–93 in the percentage of states using or anticipating use of each type of measure. The pattern is the same at the secondary and postsecondary levels. On average, states will add four measures at both secondary and postsecondary levels over this time period. The most dramatic change is the growth in the number of states adopting measures of academic and occupational skills, which are mandated in the Perkins Act but had not been required previously. Smaller numbers of states have added measures of enrollment or labor market outcomes during this time period.

Measurement of Academic and Occupational Skills

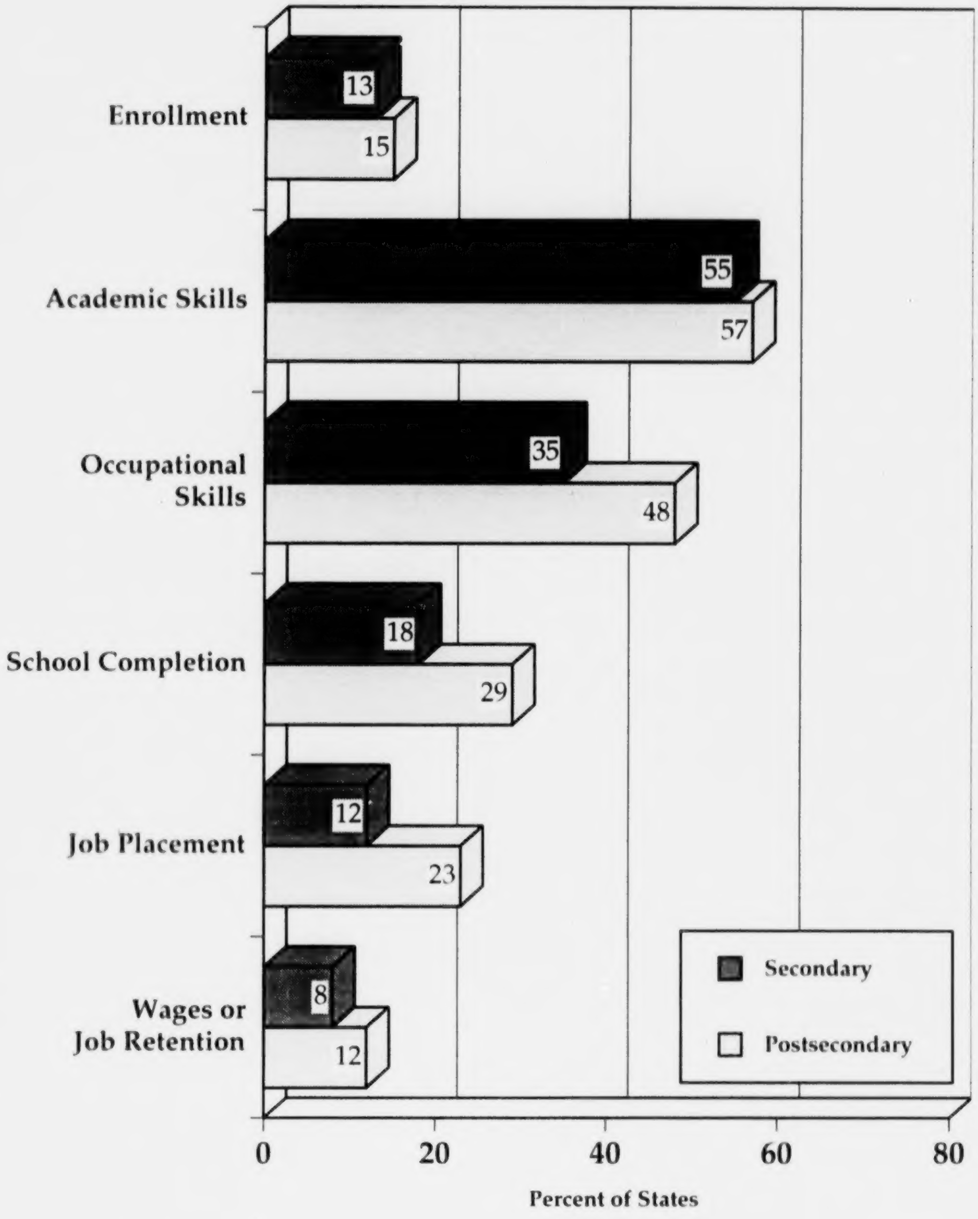
The previous results indicate that in terms of assessment, the major impact of the Perkins Act will be in the areas of academic and occupational skills. Although

Figure 11.5
States' Intended Use of Measures in 1992–93



Source: Omnibus Surveys of Secondary and Postsecondary State Agencies

Figure 11.6
Increase in States' Intended Use of Measures in 1992–93 Compared to Actual Use Prior to 1991–92



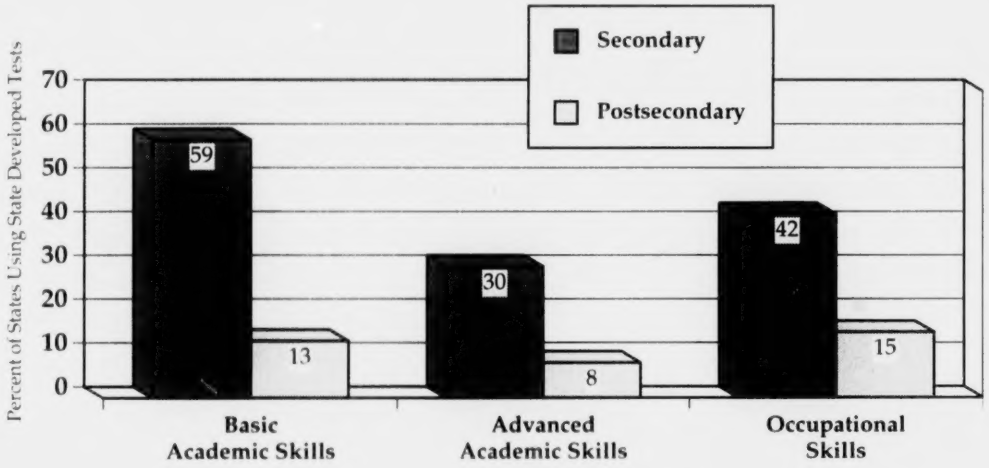
Source: Omnibus Surveys of Secondary and Postsecondary State Agencies

the majority of states are adding measures of basic academic skills, advanced academic skills, and occupational skills to their statewide systems, they are not taking the same approach to measuring each type of skill.

At the secondary level, state-developed tests play a large role in measuring all three kinds of skills. Basic skills are measured most often with state-developed tests, commercially developed tests, and formal teacher ratings. Occupational skills are measured most often by formal teacher ratings, state-developed tests, and informal teacher judgments (see Appendix Figure A-11.1).

At the postsecondary level, very few states are planning to use state-developed instruments for measuring any of the skills (see Figure 11.7). Otherwise, the choice of assessment strategies is similar at the secondary and postsecondary levels.

Figure 11.7
Intended Use of State-Developed Tests to Measure Three Types of Skills



Source: Omnibus Surveys of Secondary and Postsecondary State Agencies

Less than one-half of all regular secondary districts currently measure advanced academic skills or occupational skills in any form (see Table 11.1). Although we cannot directly compare the percentage of districts collecting skill data with the percentage of states including such data in their statewide system, we can make some very general statements about differences between current district actions and statewide intent (as described in the preceding section). Far less use was made of any skill measures (basic academic skills, advanced academic skills,

Table 11.1
Assessment of Academic and Occupational Skills at the Secondary Level in 1991–92 (Percent of Districts)

Specific Measure	Basic Academic Skills	Advanced Academic Skills	Occupational Skills
Regular Districts			
Any measure	51	41	36
Commercially developed test	39	32	12
State-developed test	33	21	12
Locally developed test	19	14	16
Informal teacher judgment	39	32	30
Formal teacher ratings	42	33	31
Vocational Districts			
Any measure	62	31	74
Commercially developed test	43	16	26
State-developed test	26	10	31
Locally developed test	26	11	51
Informal teacher judgment	42	18	56
Formal teacher ratings	45	22	68

Source: Omnibus Surveys of Regular and Vocational Districts

or occupational skills) at the district level in 1991-92 than states intend for 1992–93. If states follow through with the plans they described in the survey, it will represent a substantial change from past practices regarding the direct assessment of skills by public secondary districts.

Examining district practices further, we find that vocational districts and regular secondary districts use similar techniques for measuring basic academic skills, but differ noticeably in their practices regarding advanced academic and occupational skills. About three-fourths of vocational districts, but only about one-third of regular high school districts, assess occupational skills in any way. In contrast, regular districts are somewhat more likely to assess advanced academic skills (see Table 11.1). These differences are consistent with traditional views of the goals of regular high schools and secondary vocational schools.

Populations Included

Many states are applying their Perkins standards and measures to the widest possible group of vocational students. Almost all states are extending their statewide accountability systems to include additional students beyond those in locations funded by the Perkins Act. At least one-half of the states will apply their performance-based systems of accountability to all students taking vocational, occupational, or technical courses (see Table 11.2).

Table 11.2
Application of Performance Standards and Measures to Specific Groups of Students (Percent of States)

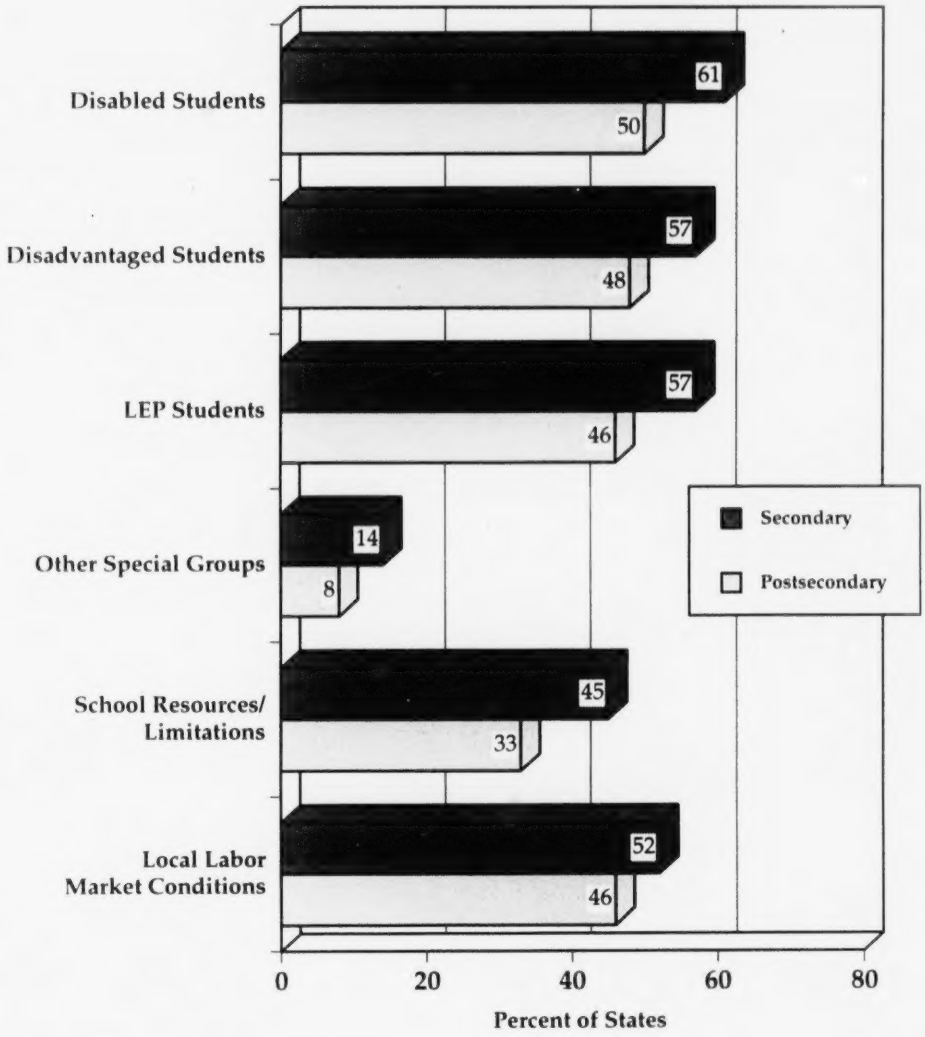
Student Groups to Which State Standards and Measures Apply	Secondary State Level	Post-secondary Level
All students taking vocational, occupational, or technical courses	64	50
Only students in Perkins funded programs	11	13
Only those meeting a state definition of a vocational student	18	—
Vocational students only, but definition has yet to be developed	18	—
Only completers of programs, degrees, or certificates	7	13
Other	4	13

Source: Omnibus Surveys of Secondary and Postsecondary State Agencies

Adjustments to Standards

The Perkins Act permits states to establish formal procedures for adjusting state performance standards to accommodate special populations, school resource limitations, and local labor market conditions. By 1992–93, one-half the states intend to make adjustments for special populations and local labor market conditions; slightly fewer will adjust standards based on school resources. The pattern of adjustments is similar at the secondary and postsecondary levels, with approximately 10 percent more states establishing procedures for each type of adjustment at the secondary level than at the postsecondary level. Most of these state-level adjustments were not in effect prior to 1990. (See Figure 11.8 for current summary and Appendix Table A-11.16 for three-year trends.)

Figure 11.8
Intended Adjustments to Performance Standards in 1992–93



Source: Omnibus Surveys of Secondary and Postsecondary State Agencies

Local Data Collection and Reporting

As noted earlier, the final adoption of statewide standards and measures will bring some changes to local data collection and reporting practices, but neither states nor districts will be starting from scratch. More than one-half of secondary districts and two-year postsecondary institutions already collect data on almost all types of measures. In fact, many measures are collected by 90 percent of the schools and institutions that were surveyed (see Table 11.3). This suggests that schools have relevant experience that provides a good foundation on which states can build systems of measures and standards.

Table 11.3
Collection and Reporting of Measures at the Secondary and Postsecondary Levels in 1991–1992 (Percent)

Type of Measure	Collecting	Reporting
Secondary Vocational Districts		
Enrollment	100	100
Academic skills	67	29
Occupational skills	92	39
Completion or retention	97	93
Placement	97	87
Wages or job retention	72	58
Regular Secondary Districts		
Enrollment	97	95
Academic skills	73	49
Occupational skills	62	37
Completion or retention	90	84
Placement	78	61
Wages or job retention	36	28
Two-Year Postsecondary Institutions		
Enrollment	98	95
Academic skills	79	35
Occupational skills	46	22
Completion or retention	95	83
Placement	91	70
Wages or job retention	72	51

Source: Omnibus Surveys of School Districts and Postsecondary Institutions

Differences in current reporting practices between vocational and regular high school districts are consistent with traditional distinctions between these types of schools. Vocational districts are more likely than regular districts to report information on placements and wage or job retention, while comprehensive high school districts are more likely to report information on academic measures (see Appendix Tables A-11.17, A-11.18, and A-11.19).

It is interesting to note that many of the data that were collected by schools were not reported to states. It is possible that these measures were collected to serve local purposes only, and were not required by state agencies.

CONCLUSION

The 1990 Perkins Act embodies a new vision of accountability in vocational education. The cornerstones of the new approach are statewide systems of standards and measures that serve as yardsticks for local program review and improvement. This chapter explores two questions regarding these systems: How much progress are states making toward implementing these standards by the fall 1992 target date? What types of standards and measures do states intend to adopt?

The Implementation Process

The National Assessment of Vocational Education occurred relatively early in the implementation process, but the surveys provide useful information about states' preparations to comply with Perkins requirements for standards and measures. The main conclusions we draw about state progress in implementing Perkins are as follows:

- States are making substantial progress toward implementing systems of performance standards and measures. Over 80 percent of the states expected to adopt secondary and postsecondary performance standards and measures by the end of the 1992–93 school year.[4] Over one-half of the states already had done so during 1991–92. By 1991–92, more than two-thirds of the states said they are developing new measures to meet their Perkins needs.

- States are implementing systems of standards and measures in a "top-down" manner. Over 80 percent of the states reported increased staff responsibilities for standards and measures at the state level, but there was relatively little activity among secondary and postsecondary schools and districts.

- In most states, vocational educators are the key players in selecting measures and standards. Special education staff also are involved to a large extent. Employers, students, parents, and other interest groups, in contrast, have limited roles in the adoption process in most states.

- Perkins Act reforms have tended to be adopted together. States that are aggressively promoting vocational/academic integration are the most active in implementing systems of standards and measures.

Policy Implications

The surveys also contain information relevant to some of the broader policy questions that will be asked as systems of performance standards and measures are fully implemented.

Will districts and schools be prepared to assume their roles in the accountability system envisioned by the Perkins Act? Once states have built the framework of standards and measures, the responsibility for using the system as a tool to improve programs falls to districts and schools. The surveys indicate that few states have devoted any resources to training, and few districts have devoted any resources to planning for measures and standards. Lack of attention to training might be understandable at this early stage of development, but it would be unfortunate to report the same conclusion after the systems have been fully implemented.

On the other hand, the surveys reveal that most school districts and two-year postsecondary institutions are already actively collecting relevant student data, some of which is reported to states and some of which appears to be for local purposes. This suggests at least some familiarity with student assessment or program evaluation activities, which may help institutions meet Perkins Act accountability demands.

Will the implementation of standards and measures differ significantly at the secondary and postsecondary levels? It is clear from the surveys that the statewide systems of standards and measures will create somewhat different challenges for secondary and postsecondary institutions. For example, comprehensive high schools report that they do not regularly use measures of occupational skills in their vocational programs, while postsecondary schools are less likely to be collecting measures of advanced academic skills. Both types of measures must be included in statewide systems, so institutions at the two levels will face different challenges and states must be prepared to respond to different types of problems.

Will new assessment instruments be of adequate quality to support decisions about students and programs? Many states reported that they are developing new assessment instruments, particularly at the secondary level. While some states have been working on these assessments for years and have devoted considerable resources to the effort, others have less experience in assessment development. It will be important to examine the reliability and validity of new instruments developed specifically for Perkins Act accountability systems. Poor-quality measures could undermine the utility of the whole system.

Can a common core of measures in all states serve as a basis for national assessment or state-to-state comparison? The survey was conducted too early in the implementation cycle to indicate whether the measures chosen can be aggregated or compared nationally. The survey findings do, however, support tantalizing inferences. The widespread use of multiple measures offers fertile ground for finding comparable measures, and nothing in states' actions precludes this happening.

However, the survey also reveals variability among states, and we suspect that without coordination of state actions, differences will predominate. It is clear that states are now actively engaged in a process of change. If the federal government wanted to act to promote some degree of standardization, this might be an opportune time to do so. It will be much more difficult to achieve common measures once state systems are adopted and operational.

What effects will systems of performance standards and measures have on vocational programs? The ultimate test of the Perkins model of accountability is whether these systems improve or hinder the effectiveness of vocational education programs at the secondary and postsecondary levels. While there is some evidence from the survey that schools have had positive experiences with performance standards in the past, the survey occurred much too soon to obtain credible information about impact.[5] Additional research will be necessary to judge how standards and measures affect programs. This is the most significant question about performance standards and measures that remains unanswered.

ENDNOTES

1 Final federal guidelines for implementing the Act had not been issued at the time of the survey. States were operating on the basis of preliminary guidelines.

2 To measure "aggressiveness in promoting vocational/academic integration," states were assigned to quartiles based on the number of different integration-related activities they reported in the current and previous school year. This variable was then cross tabulated with the questions relating to the development of performance standards and measures.

3 States were assigned to quartiles based on self-reports of total public expenditure on vocational education in 1990–91.

4. All states had developed systems of measures and standards by fall 1992, but a few were still awaiting official adoption as late as spring 1993 (personal communication with M. Rahn, National Center for Research on Vocational Education, February 18, 1993).

5 Specifically, local administrators at two-year postsecondary institutions, vocational school districts, and comprehensive school districts were asked to rate ten different changes contained in the Perkins in terms of their probable impact on administering and implementing of vocational programs in their institution. On average, most of these reforms, including performance standards and measures, received a neutral rating. Practitioners were somewhat more positive; most agreed (49%) or strongly agreed (11%) that "the performance standards and accountability procedures used in this school have improved vocational education practice and vocational students' competency attainment." This suggests that schools have had positive experiences with performance-based accountability in vocational education, which may provide a positive foundation on which Perkins can build. At the time of the survey, however, states had not yet adopted final standards, and schools and districts had no experience evaluating programs in light of statewide standards. Consequently, respondents had to base these judgments of likely impact on partial knowledge, at best.

CHAPTER 12

INTEGRATION OF ACADEMIC AND VOCATIONAL CURRICULA

THE ROOTS OF ACADEMIC/VOCATIONAL INTEGRATION

The Public Policy Issue

Academic and vocational education have been on separate tracks since the beginning of public vocational education in this country. Through the late 19th century, public secondary education had traditionally been academic, designed to prepare small numbers of students for college or clerical work. In 1890, according to one estimate, only 3.5 percent of 17-year-olds graduated from high school[1].

By the early 20th century, a growing coalition of businesses, education reformers, and others persuaded public school systems to link education more directly to work. In some cities, the movement led to the creation of business and commerce courses in regular high schools. But the movement's larger effect, in line with its main purpose, was the creation of separate all-day trade schools, continuation schools for youth in the labor force, and vocational evening schools. By 1910, 29 states were providing some form of vocational education in agriculture, trade and industry, home economics, and manual training[2].

Leaders of the vocational education movement, such as Charles Prosser, executive director of the National Society for the Promotion of Industrial Education, and David Snedden, Massachusetts' education commissioner, emphasized the need to prepare youth for entry-level jobs by providing specific occupational skills in separate vocational schools.

In turn, critics of this brand of vocationalism, such as John Dewey, argued that such specific skill training was unnecessarily narrow and that a dual school system would create invidious distinctions among youth and undermine democracy. Dewey believed that occupational studies should be part of a broader and richer curriculum in secondary education[3]. Thus, by the second decade of the century, the debate over the curricular and physical separation of vocational education from regular education had been framed.

The Smith-Hughes Act of 1917 emphatically reflected the views of Prosser, Snedden, and their allies. It helped fund separate vocational schools, particularly the continuation schools. It supported agricultural education, trade and industrial education, and home economics, but denied funding to occupational courses, such as business and commerce, in comprehensive high schools. It called for specific skill training and focused on entry-level jobs.

The legislation set up the Federal Vocational Education Board (the first and only federal school board) to oversee the administration of the Act. It also supported, or prompted the creation of, separate state boards and administrations devoted to vocational education. As is true today, states had to generate and submit plans for the use of federal vocational education funds.[4]

The Smith-Hughes Act contributed substantially to the separation of academic and vocational education, and its legislative successors continued in this tradition into the 1980s. Although the newer laws were different from Smith-Hughes in many ways, they continued to assume that vocational and academic education would remain separate endeavors in administrative and curricular, if not always in physical, terms. The 1963 Vocational Education Act, for example, redefined vocational education to include occupational programs, such as business education, in comprehensive high schools. It also subsidized the construction of the half-day area vocational schools that today provide most of the vocational education that occurs in separate facilities.

In the mid-1980s, however, education reformers concerned about the status and role of vocational education began to call for a reversal of the traditional pattern. Vocational enrollments were declining, and many critics charged that vocational education was, in effect, a separate and unequal form of public schooling. The 1983 report of the National Commission on Excellence in Education, *A Nation at Risk*,[5] largely ignored vocational education. Many felt that the nature and quality of vocational education were part of the problem of the nation's declining international competitiveness.

In 1984, a year after the Excellence Commission's report, the National Commission on Secondary Vocational Education published *The Unfinished Agenda: The Role of Vocational Education in the High Schools*.[6] The report called for integrating academic and vocational education and provided a major impetus for reforming vocational education. Other reports in the middle and late 1980s stressed the need for schools to place more emphasis on basic academics and on training students to think well and clearly.[7]

The 1989 National Assessment of Vocational Education strongly recommended integrating academic and vocational education. The Assessment found that men with no education beyond high school use only about 33 percent of all their occupationally specific courses in their jobs, and women use about 46 percent. Much of the problem is due to the fact that participants in secondary vocational education usually do not get jobs in the fields for which they were trained.

The Assessment noted that "these rates are low enough to call into question the efficacy of highly specific forms of occupational training for many students at the secondary level. It may be possible to restructure secondary vocational education, however, so that it serves students with different work and educational goals more effectively."[8] The report went on to recommend a curriculum alternative that would provide "broad occupational training and integrated academic and vocational instruction." The 1990 Perkins Act, of course, reflects this emphasis.

The Changing Workplace

The changing organization of work has also been important in the development of vocational education and in the current movement toward integration. The rise of vocationalism around the turn of the century reflected a shift in the economy from craftsmanship to industrial organization.[9] Henry Ford pioneered, and Frederick Taylor rationalized, a system of industrial production that relied on subdividing labor and mechanizing production. Industries needed workers who could function as parts of a machine, using narrowly defined specific skills in endless repetition. Workers were not expected to think; that was management's role.

The Ford/Taylor model of industrial production was effective and competitive into the 1960s. In the 1980s, however, manufacturing jobs, the backbone of American industry, began to migrate to other countries, where labor costs were lower. As the semiskilled manufacturing jobs in the United States declined, technical and service jobs increased.

The Japanese economy demonstrated that the use of highly skilled labor, an emphasis on quality and customer satisfaction, and a new organization of work were major factors in international economic competitiveness. The organization of work pioneered in Japan by W. Edwards Deming was key to this transformation. Sometimes called the "high-performance workplace," it overturns the Ford/Taylor model. Instead of tying workers to simple, narrowly defined tasks, it stresses the need for each worker to perform a range of more complex tasks, and often to rotate jobs. Instead of relegating workers to mindless manual work and leaving the thinking to management, it requires workers to use their minds and the full range of their skills to diagnose and solve problems, assess the quality of products, and improve production and services. Instead of a process in which the relations between workers and machines and workers and supervisors are central, the high-performance workplace requires employees to work together as teams.

As Chapter 14 shows, in the late 1980s the number of American firms informally estimated to be using high-performance work methods was very small—around 5 percent. However, a 1992 survey found evidence of substantial use of high-performance work methods in 37 percent of American firms with more than 50 employees. While further research on this subject is needed, it seems clear that a significant and increasing number of firms are adopting this form of work organization.

Many of these changes in the workplace have contributed to the movement to integrate academic and vocational education. Integration seeks to improve the intellectual development of students by using applied learning, consistent with the need to think clearly at work, master a variety of complex tasks, rotate jobs, and perform quality control. Integration changes the focus of education from specific vocational skills to broader and more generally applicable academic and occupational skills, consistent with the breadth, flexibility, and qualities of mind needed in the high-performance workplace. Integration is also compatible with a team approach to learning in an applied context.

The Theoretical Context

Another contributor to the movement for integrated academic/ vocational education is the research on contextualized education initiated by Loren Resnik at the University of Pittsburgh. Resnik[10] argues that students learn better when a subject is placed in a context that is meaningful to them and related to the world outside of school than when it is taught in the abstract, dissociated, and rote manner that she believes characterizes most teaching in American classrooms.

Proponents of integrating academic and vocational education have adopted contextualized education as one of the theoretical bases of the movement. For example, Adelman[11] observes that vocational education courses could provide an ideal context for learning academic concepts in work-relevant situations. A review of the literature on contextualized learning that describes and assesses this kind of education is discussed later in this chapter.

In light of the changes in workplace organization and the plethora of recommendations for reform generated in the middle and late 1980s, the 1990 Perkins Act places heavy emphasis on integrating academic and vocational curricula. Specifically, the Act requires that Title II, Part C funds, which provide the bulk of assistance to local districts and institutions, be used to "provide vocational education in programs that . . . integrate academic and vocational education . . . through coherent sequences of courses so that students achieve both academic and occupational competencies."

THE STRUCTURE OF INTEGRATION

What does the integration of academic and vocational curricula entail? Norton Grubb has found that schools bring academic and vocational education together in a number of different ways, which comprise eight different models of integration. Stasz, et al.[12] have summarized these models as follows:

1. **More academic content is incorporated in vocational courses** taught by vocational teachers to vocational students.

2. **Academic and vocational teachers combine to incorporate academic content into vocational programs.** Unlike model 1, this approach requires teachers to collaborate in curriculum development.

3. **Academic courses are made more vocationally relevant** by including more vocational content in academic courses or by adopting new courses such as "applied academics."

4. **Curricular "alignment"** is accomplished by modifying or coordinating both academic and vocational curricula across courses . . . or over time. . . .

5. **Senior projects** are done in lieu of elective courses and require students to complete a project that integrates knowledge and skills learned in both academic and vocational courses.

6. **The Academy model** is a school-within-a-school that aligns courses with each other and to an occupational focus. It is a program for selected students within a high school.

7. **Occupational high schools and magnet schools** align courses with each other and to an occupational focus for all students and programs in the entire school.

8. **Occupational clusters, career paths, and occupational majors** feature a coherent sequence of courses and alignment among courses within clusters. Teachers are often organized by clusters, not traditional departments.

Stasz et al.[13] note that Grubb and Kraskouskas[14] have also identified eight models of integration at the postsecondary level. These models are listed in Appendix 12-B.

IMPLEMENTING THE INTEGRATION OF ACADEMIC AND VOCATIONAL EDUCATION

This section uses Omnibus Survey data to examine efforts by states, districts, schools, and postsecondary institutions to integrate their academic and vocational curricula, consistent with the provisions of the Perkins Act. Prominent among the integration efforts examined are steps related to the models of integration identified by Grubb and his colleagues. Because the Perkins requirement for integration applies only to districts and postsecondary institutions receiving basic grants, we look at grant recipients specifically, as well as at districts and postsecondary institutions in general.

The survey data indicate fairly widespread efforts at all levels to integrate, and more efforts in Perkins-funded districts and postsecondary institutions than in those not receiving funds. However, other survey data and case study information strongly suggest that integration activities are new and small, that they tend to be ad hoc, and that they typically depend on the efforts of a few individuals in an organization.

Efforts by State Agencies

How active are state agencies in promoting the sort of integrated education envisioned by the Perkins Amendments? Table 12.1 shows the proportions of state secondary and postsecondary agencies responsible for vocational/ occupational education saying that they have taken specific steps to integrate academic and vocational curricula. (The percentages for state secondary agencies are ranked for 1991–92.)

Some clear patterns are evident in the table. In every case a larger proportion of secondary than postsecondary state agencies have taken specific steps to integrate academic and vocational education. In 1992 secondary agencies were up to four times as likely as their counterparts to take such steps. Also, in every case but one, more states reported specific steps to integrate in 1991–92 than in 1990–91.

In general, state secondary agencies are undertaking a wide range of initiatives in support of integration. A majority of agencies had taken all but three of the steps listed in Table 12.1 by 1991–92. The most widespread practices reported for 1991-92 were (a) helping purchase applied academic or other curriculum materials from commercial vendors; (b) providing in-service training for vocational teachers on integration; (c) providing technical assistance for administrators; and (d) funding pilot projects that integrate academic and vocational education. At least three-fourths of all state secondary agencies had taken all four of these steps by 1991–92; over nine-tenths had purchased applied curriculum materials.

Many of the steps reported are fairly concrete, requiring a commitment of time and other resources (e.g., purchase of materials, training of teachers and administrators, and funding for pilot projects). However, the **amount** of support states offer in some of these areas is rather modest. In 1991–92, for example, the median number of vocational teachers receiving integration training from a state was 197; the median number of academic teachers was 128.

Table 12.1
Percent of State Secondary and Postsecondary Agencies Taking Specific Steps to Promote Academic and Vocational Integration, 1990–91 and 1991–92

	Secondary		Postsecondary	
Steps Toward Integration	1992	1991	1992	1991
Help make available applied academic or other integrated course materials from commercial vendors (e.g., CORD or AIT)	91	86	61	54
Provide in-service training for vocational teachers on integration	84	61	37	22
Provide technical assistance for administrators on integration	80	69	55	28
Fund pilot projects that integrate academic and vocational education	77	71	44	29
Provide in-service training for academic teachers on integration	71	54	18	9
Provide recommended curriculum frameworks or guidelines for academic/vocational integration	63	52	32	22
Provide guidelines on development of coherent sequences of courses	61	40	36	26
Promote participation in a regional curriculum, such as SREB, that supports integration	57	49	54	40
Develop or disseminate state-developed integrated curricula	55	44	23	22
Adopt a definition of integration	50	27	34	15
Combine vocational curriculum frameworks with those of academic departments at state level	40	26	31	16
Provide mandatory curriculum frameworks or guidelines for academic/vocational integration	21	20	17	19

Source: Omnibus Surveys of Secondary and Postsecondary State Agencies

All of these efforts by state secondary agencies to integrate academic and vocational education increased from 1990–91 to 1991–92. The increases are consistent with the hypothesis that the Perkins Act is causing or influencing the agencies to move toward integration. However, a cause-and-effect relationship cannot be proven; many other things may have brought about or contributed to these changes as well.

The largest increases in state secondary agencies' efforts to integrate were in adopting definitions of integration, providing guidelines on the development of coherent sequences of courses, and training vocational and academic teachers. Between 1990–91 and 1991–92, the number of states adopting a definition of integration almost doubled.

Postsecondary agencies are much less active in promoting integration. In 1991-92, only three kinds of steps were taken by a majority of postsecondary state agencies—purchasing applied academic materials (as at the secondary level, the most popular step), providing technical assistance for administrators, and promoting participation in regional consortia to support integration.

In some types of activity the difference between the proportions of secondary and postsecondary agencies taking steps to integrate is striking: 84 percent of secondary and 37 percent of postsecondary agencies provide in-service training to vocational faculty; 71 percent of secondary but only 18 percent of postsecondary agencies provide such training for academic faculty; 80 percent of secondary and 55 percent of postsecondary agencies provide technical assistance for administrators on integration. In general, the proportions of secondary agencies taking other steps to integrate are one and a half to two times as large as the proportion of postsecondary agencies doing so.

To some extent these differences can be explained by the different structures and functions of state secondary and postsecondary agencies. For example, state secondary agencies tend to be much more active than their counterparts in providing teacher in-service training of all kinds. Nevertheless, some postsecondary agencies have taken each of these steps, and many should be able to recommend curriculum frameworks, provide guidelines for course sequences, and take other steps to promote integration.

The number of postsecondary state agencies taking steps to integrate is increasing in most areas of activity. The largest increases are in the proportions of postsecondary agencies providing technical assistance on integration, adopting definitions, funding pilot projects, and combining vocational and academic frameworks at the state level.

District Efforts to Integrate

Federal and State Support for District Integration Efforts

In Chapter 10 we saw that federal and state support for integration are important factors in the number of steps districts take to integrate their curricula. In the preceding section of this chapter we saw that state secondary agencies have initiated many activities to promote integration, but that in some cases these activities are fairly limited. How do district administrators assess the support they receive from the Perkins Act and from their states? How many districts are affected by federal and state initiatives promoting integration? Data from the Omnibus Survey address these questions.

Approximately 84 percent of the local districts surveyed reported having taken at least some steps to integrate academic and vocational curricula by 1991–92. Of those, about one-third said the Perkins Act was largely instrumental in motivating their efforts to integrate. Other national reform efforts, such as the report of the (Labor) Secretary's Commission on Achieving Necessary Skills (SCANS); *America's Choice: High Skills or Low Wages; America 2000*; and the National Education Goals reports were cited less often as reasons for integrating.[15]

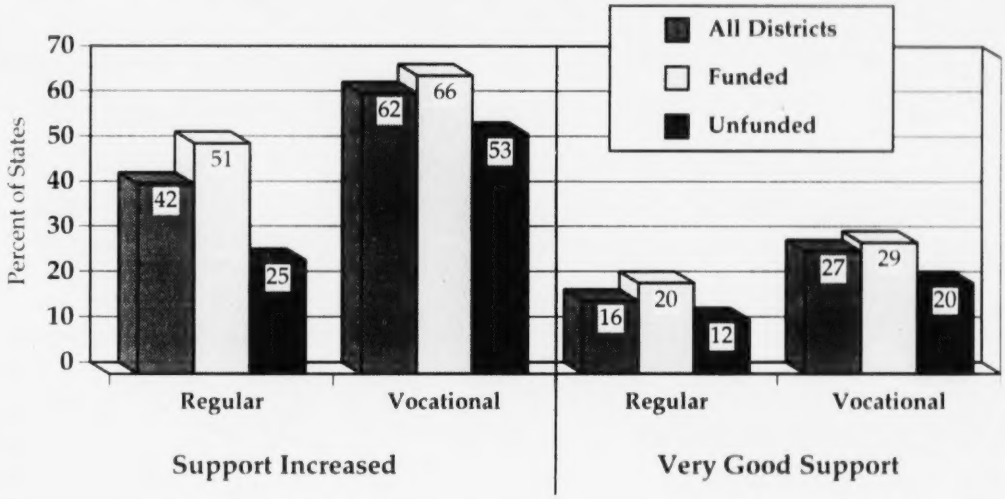
Although the perceived impact of the Perkins Act on integration efforts in all districts together was not dramatic, it was much more marked in districts funded with Perkins money. Funded districts were more than three times as likely as others to credit Perkins with motivating their integration efforts.

While about half of the districts said that state support for integration in 1991–92 was "adequate," only about one-fifth said that it was "very good." Less than half (45 %) of the districts (regular and vocational combined) said that state support for integration had increased from 1990–91, when, under the previous Perkins Act, integration was not a priority. Vocational districts and Perkins-funded districts were more likely than regular districts and unfunded districts to say they received "very good" state support (see Figure 12.1). These data indicate that although districts are not unhappy with the level of state support they receive, but they do not think it is especially strong.

Local Implementation Efforts

How extensive are local efforts to integrate vocational and academic curricula? The Omnibus Surveys asked district administrators to report on ten specific steps to integrate the two streams of education. The percentages of regular and vocational districts taking each step in 1990–91 and 1991–92 are shown in Table 12.2.

Figure 12.1
Regular and Vocational Districts Reporting on State Support for Integration, by Funding Status



Source: Omnibus Surveys of Regular and Vocational Districts

The steps most frequently reported were (a) holding planning meetings; (b) developing guidance and counseling activities to promote integration; (c) integrating curricula across both vocational and academic courses; (d) providing training for vocational teachers; and (e) developing sequences of integrated academic and vocational courses. At least half of the regular districts and three-quarters of the vocational districts reported having taken these steps by 1992.

In every category, higher proportions of vocational than of regular districts reported efforts to integrate. The median number of steps taken by vocational districts was five out of a possible ten; the median number taken by regular districts was four.

The differences between the two types of districts can be illustrated by examining teacher training on integration. Some 73 percent of the vocational districts reported having trained vocational teachers on integration by 1991-92, and 61 percent reported training academic teachers. A median 17 vocational and nine academic teachers received training from these vocational districts. On the other hand, among the regular districts, 55 percent provided training for vocational teachers and 43 percent for academic teachers. The median numbers of teachers trained in regular schools were three vocational and six academic teachers.

Table 12.2
Percent of Regular and Vocational Districts Taking Specific Steps to Integrate Academic and Vocational Education, 1990–91 and 1991–92

	Regular		Vocational	
Steps Toward Integration	1992	1991	1992	1991
Hold planning meetings	67	39	88	64
Develop guidance and counseling activities to promote integration	64	41	73	50
Integrate curricula across academic and vocational courses	63	42	83	58
Provide in-service training for vocational teachers on integration	55	32	73	48
Develop sequences of integrated academic and vocational courses	53	36	74	50
Provide in-service training for academic teachers on integration	43	21	61	37
Develop occupational clusters, career paths, or occupational majors	39	26	69	53
Evaluate vocational teachers on instruction in mathematics, reading, and/or writing	25	16	56	32
Develop academies or occupationally oriented schools within schools	14	9	26	15
Develop occupationally oriented magnet high schools	8	5	19	17

Source: Omnibus Surveys of Regular and Vocational Districts

The smallest differences between the two types of districts seem to be in activities that are relatively easy for all districts to do (such as supplementing guidance and counseling) or very difficult for all districts to do (such as developing career academies or magnet schools). Regular and vocational districts are more nearly similar in this respect, because most districts can do the easy things and most districts cannot do the difficult things. The largest differences between the two types of districts are in taking the in-between steps—such things as developing occupational clusters, developing sequences of vocational and academic courses, and evaluating vocational teachers on instruction in mathematics, reading, and/or writing. Such steps require planning and effort beyond the routine but are still feasible for districts intent on integrating their curricula.

Every category of activity in both types of districts increased from 1990–91 to 1991–92. Most of the increases were fairly substantial—on the order of 20–25 percent of districts added new steps to integrate. With only a few exceptions, the increases in the regular systems were about the same size as those in the vocational systems. However, because the regular districts were starting from a lower base, their rate of change was greater. If the relative rates of change continue, the regular systems will gain ground on their vocational counterparts, especially as the latter approach a "saturation point" on some of these measures.

There are also substantial differences between districts that received Perkins funds in 1991–92 and those that did not. Funded districts were more likely than unfunded districts to report taking steps to integrate their curricula. In every category, funded regular districts were more likely than unfunded regular districts to be integrating, and funded vocational districts were more likely than unfunded vocational districts to be taking steps to integrate. (See Appendix Table A-12.1)

Some of the case studies provide examples of the stimulative effects of Perkins funds. In one Pacific Coast city, researchers found that

> with the infusion of Carl Perkins funds and restructuring ideas, vocational and academic teachers at many schools were beginning to talk to each other. . . . In the newer vocational classes, such as the introductory technology course, academic materials were being integrated into vocational classwork.

However, "vocational faculty believed that more . . . integration was taking place than did their academic colleagues."

School Efforts to Integrate

The Assessment also examined the prevalence of efforts to integrate curricula in regular comprehensive high schools and secondary vocational schools. A comparison of Tables 12.2 and 12.3 suggests that schools may be less active in integrating than districts are. In comparable categories, smaller proportions of schools than of districts reported taking steps to integrate. In particular, smaller percentages of schools reported integrating curricula across academic and vocational courses and developing sequences of integrated academic and vocational courses.

Table 12.3
Percent of Comprehensive and Vocational Schools Taking Specific Steps to Integrate Academic and Vocational Education, 1990–91 and 1991–92

	Comprehensive		Vocational	
Steps Toward Integration	1992	1991	1992	1991
Incorporate employability or generic workforce skills into vocational curricula	73	67	87	82
Develop integrated curricula across academic and vocational courses	50	38	71	52
Establish procedures for collaboration between academic and vocational teachers to develop integrated course offerings	48	31	59	39
Use cross-curriculum materials	47	39	46	39
Develop sequences of integrated academic and vocational courses	45	35	58	42
Use applied academics or other integrated curricula from commercial vendors	35	23	52	40
Provide "tandem courses" where students take coordinated academic and vocational courses	22	16	33	27
Provide common planning periods for academic and vocational teachers to work on integration	20	16	31	23
Increase time available to teachers to work on integrated courses	18	9	29	17
Provide interdisciplinary courses combining occupational issues and academic disciplines	14	12	17	12

Source: Omnibus Survey of Secondary Schools

These differences between districts and schools may result from differences in the kinds of organizations responding to the survey—districts and schools. Although most districts contain only one secondary school, the larger districts are reporting for more than one school. In these districts, any integrated activity at any secondary school would be reported as district activity. On the other hand, a surveyed school is reporting for only one school, that is, for itself. Its report will not reflect activities in any other schools that may be in its district. Thus a school is less likely than a district to report a given type of integrated activity, and school reports more accurately reflect the prevalence of steps to integrate curricula.

The most common integrating practice reported by schools is also the one that requires the least modification of the curricular structure—incorporating employability or generic workforce skills into existing vocational curricula. The hallmark of this approach is that the modifications are limited to the vocational curricula, without affecting academics or other aspects of teaching and learning in schools.

This approach might typically involve broadening vocational courses to include more mathematics or lessons in communications and teamwork; including labor market and job-search information in an introductory technology course; or requiring a semester of computer training for all students concentrating in vocational education. In 1991–92, 73 percent of comprehensive high schools and 87 percent of vocational schools reported taking, or having taken, such steps to integrate their curricula.

A smaller but still sizeable number of schools—about half of the comprehensive high schools and 70 percent of vocational schools—have taken a second approach, that of integrating curricula **across** academic and vocational courses. This more ambitious approach to integration might typically involve a math and an electronics teacher coordinating their course content, or a biology and a health teacher doing so. Most of the schools taking this approach have also taken other preliminary steps to integrate across curricula, such as establishing procedures for collaboration between academic and vocational teachers and developing one or more sequences of academic and vocational courses.

Between one-third and one-half of the schools surveyed reported using integrated curricular materials, such as reading across the curriculum, writing across the curriculum, and applied academics or other integrated materials from commercial vendors. Many of these curricular materials are designed to fit into existing academic or vocational programs. While the great majority of states are investing in applied academic materials, the purchase of applied materials by schools is a significant but not dominant feature of integration.

Approximately one-fifth of comprehensive high schools and one-third of vocational schools provide "tandem" courses, where students take coordinated pairs of courses, such as specially designed math and agriculture or biology and health courses. Taking the process of linkage a step further, a small number of schools (less than one-fifth) have created new courses combining academic disciplines and occupational issues in one. Examples might be a course on the History of Technology or on Society and Technology. New courses are fairly difficult for high schools to create; doing so typically requires district approval, purchasing or developing new materials, and training teachers or hiring new ones.

As at the district level, vocational schools were more likely than comprehensive high schools to report taking steps to integrate, and schools were doing more to integrate in 1991–92 than in 1990–91.

It is significant that the largest increases occurred in areas dealing with integration **across** academic and vocational courses, rather than merely supplementing vocational courses. The proportion of schools developing integrated curricula across disciplines increased by 12–19 percent between 1990–91 and 1991–92, depending on type of school.

In contrast, the proportion of schools following the more traditional approach of supplementing existing vocational courses increased by only 5–6 percent. While large majorities of schools were employing this conservative approach, it has not gained additional ground very fast, and may have "peaked out" in many districts. It is also possible that the Perkins Act and other reform initiatives may have caused interest to shift to cross-curricular efforts.

What vocational and academic subjects are being integrated in secondary schools? According to administrators who reported any integration in 1991–92 and who said that a given vocational subject had been integrated with English, math, or science, the vocational subjects most likely to be integrated were business and office (55%), and trade and industry (49%). About one-third of the schools reported agriculture being integrated with academic subjects and one-fourth reported marketing, occupational home economics, and health being integrated. The median number of subjects integrated—that is, combinations of one vocational and one academic subject—in these schools was three.

There is some correspondence between the distribution of vocational subjects being integrated and the prevalence of those subjects in schools. Business, and trade and industry are the vocational programs most likely to be integrated; they are also the programs most often available. However, there are some differences between the two distributions. In particular, agriculture programs are apparently being integrated out of proportion to their numbers (they constitute only 8% of all secondary vocational programs).

The Depth of Integration Efforts

The state and local survey data indicate that some integration-related activities are widespread **across** districts and schools, but we must ask how much change is taking place **within** them. Here the answers are not so encouraging. The data provide evidence of an adaptive approach to integration, where districts and schools make small changes to accommodate a reform in the existing structure, rather than undertaking the kind of systemic reform envisioned by the Perkins Act. One example of this is the greater tendency of schools to integrate by modifying existing vocational and academic courses than by integrating across curricula. Another is the use of applied academics materials, which are easily accomodated within the curricular structure. It is also significant that only small percentages of vocational teachers (11% or less) spend more than 10 percent of class time on most academic subjects, and even smaller percentages of academic teachers spend that minimum amount of time on occupational principles. (See Chapter 9.)

The absence of systemic support for academic and vocational teachers to work on integration issues is a major problem for integration. For example, while a majority of the schools in the survey said that they had established procedures for collaboration between academic and vocational teachers, only about one-third of those **reporting such procedures** provided common planning periods, and only about one-fourth made increased time available to teachers. Similarly, although the majority of schools said that some of their teachers were working together to develop integrated courses, only about one-fourth of those reporting this kind of cooperation had set a regular schedule for doing so. Thus, in about three-fourths of the schools where academic and vocational faculty are working together, they are apparently doing so on their own time.

The Omnibus Survey data are strongly supported by information from the Teacher Survey. Only about one-fourth to one-third of vocational teachers say they **ever** "coordinate curricula or team teach" with English, math, or science teachers. In fact, vocational teachers are more likely to coordinate curricula among themselves than with academic teachers, and academic teachers show the same tendency to limit coordination to themselves. Thirty-seven percent of vocational teachers say they often or always coordinate vocational courses; 11–13 percent of academic teachers say they always or often coordinate academic courses; but only 3–6 percent of vocational and academic teachers say they coordinate courses **with each other** that often.

The survey findings are echoed in the case studies. For example, in one northeastern district researchers found that "the biggest impediment [to integration] is the lack of time." Lack of planning time seems to result in an ad hoc approach that depends primarily on individual initiative. In a plains-state high school, for example, case-study researchers found that

> academic/vocational integration efforts are obviously sporadic and depend heavily on the inclinations of individual teachers.

In a large midwestern urban center,

> Schools were primarily integrating course curricula on an informal and sporadic basis. There was only one school . . . that was actively and formally producing an integrated curriculum. This school was still in the planning stages. . . .

In a western city, one of the few integrated courses, trade and technical mathematics, was not being taught because the teacher was on sabbatical.

Lack of time, and lack of resources to purchase time, can be seen both as indicators of limited effort and as obstacles to integration. The literature on such obstacles is included in a review conducted by Stasz and others,[16] and we will not discuss them all. However one impediment is strikingly clear in the case studies and deserves attention here.

Case study data show that ingrained patterns of separation between academic and vocational teachers, and their indifference or resistance to changing what and how they teach, are major obstacles to integration. For example, in a high school in one western community, "several teachers and administrators indicated that 'territoriality' based on discipline affiliation . . . impedes integration efforts." Teachers at a comprehensive high school in the South described a "wall" between academic and vocational faculty. At a western high school, researchers noted that "no real interaction with academic teachers occurs."

The distance between academic and vocational teachers is illustrated by the following description of a meeting in one vocational high school:

> In the teachers' interview, which included nearly all the vocational and academic teachers, [they] segregated themselves into two groups according to their vocational or academic status. . . . When the topic of integration was broached, they first laughed, then attempted to describe some examples of it, then admitted that they work in different parts of the building and rarely get into each others' part.

In general, vocational teachers seem to be more interested in integration than academic teachers (although many on both sides of the divide prefer to leave things as they are). For example, in an urban midwestern high school, researchers noted:

> The [vocational] teachers pointed out . . . that integration is not the focus of academic teachers: "Academic teachers are not forced to include us [in their discussions], as we are forced to include them."

Relative lack of interest on the academic side is also evident in the Omnibus state surveys: Respondents in secondary and postsecondary agencies are about twice as likely to think that state vocational officials support integration as they are to think that state academic officials do.[17]

The Quality of Integrated Education

Suppose that secondary integration efforts achieve the depth and coherence that they seem to lack at present. Can we assume that the result will be better education? Not necessarily. It depends on the quality of the integrated course offerings. Studies by a number of researchers indicate that, at the secondary level, integration typically involves instruction of very basic academic skills. Indeed, several researchers have observed that "when academic material is incorporated into vocational courses, it is at such a low level as to be considered remediation."[18] Whether such materials can be of much benefit to students other than those with special needs is a serious question.

Further, questions must be raised about the general quality of the integrated curriculum materials being offered commercially. There is some evidence, discussed later in this chapter, that two of the better known applied curriculum packages, *Principles of Technology* and, to a lesser extent, *Applied Mathematics*, are effective in improving student test scores. However, there is almost no solid research on the hundreds of other offerings, and there are many examples of poor-quality materials.

If instruction in integrated courses is and remains at low levels, students in training for careers would probably be better off in traditional academic classes. Data presented in the 1989 National Assessment of Vocational Education indicate that taking algebra tends to raise the math scores of non-college bound students approximately ten times as much as taking math-related vocational courses.[19]

At present the information on this subject is largely anecdotal, and no doubt many examples of strong integrated courses and poor academic courses can be found. The point is that it should not be assumed that integration **per se** will transform vocational education. Integrating poor-quality academic and vocational materials will provide little benefit to students.

Integration at Postsecondary Institutions

How extensive is the integration of academic and vocational curricula in postsecondary institutions? The proportion of institutions reporting at least some efforts to integrate their curricula was about the same as the proportion of secondary districts doing so: 86 percent of postsecondary institutions and 84 percent of school districts reported taking steps to integrate by 1991–92. Table 12.4 shows the percentages of public secondary schools and two-year postsecondary institutions that took specific steps to integrate their curricula in 1990–91 and 1991–92.

Table 12.4
Percent of Secondary and Postsecondary Institutions Taking Specific Steps to Integrate Academic and Vocational Education, 1990–91 and 1991–92

	Secondary[a]		Postsecondary[b]	
Steps Toward Integration	1992	1991	1992	1991
Support remedial/developmental education	—	—	95	94
Establish general educational competencies for occupational/technical students	—	—	83	73
Hold planning meetings to establish policies or procedures for integration	67	39	76	58
Develop applied academics courses (e.g., Technical Math, Business English)	—	—	73	71
Use cross-curriculum materials (e.g., Writing Across the Curriculum)	47	39	59	52
Provide in-service training for vocational faculty on integration	55	32	45	32
Provide "tandem" courses where students take coordinated academic and vocational courses	24	18	43	40
Provide in-service training for academic faculty on integration	43	21	35	24
Provide interdisciplinary courses combining occupational issues and academic disciplines	15	12	34	29
Use applied academics or other integrated courses from commercial vendors	38	26	23	15

[a] Secondary data are from Omnibus School Survey, except for items on in-service training, which come from the District B Survey.

[b] Data from the Omnibus Survey of Postsecondary Institutions

Postsecondary institutions seem to be further along than secondary institutions in promoting some kinds of integration, but not as far along in other areas. Postsecondary institutions are more likely to hold planning meetings, use cross-curriculum materials, and provide tandem and interdisciplinary courses. Secondary districts are more likely to provide in-service training for academic and vocational teachers, and secondary schools are more likely to use applied academics materials from commercial vendors.

One of the strengths of the postsecondary institutions is their ability to create or adopt curricula that cut across discipline lines. Community colleges especially seem to have more freedom to develop new courses than secondary schools. The largest differences between secondary and postsecondary schools are in this area. Postsecondary institutions are about twice as likely as secondary schools to provide tandem and interdisciplinary courses. In addition, three-fourths of them reported having developed applied academics courses, such as Technical Math, and Business English. There are no comparable estimates of the prevalence of these courses in secondary schools.

Another area of strength in postsecondary integration is the existence of general education competencies for occupational/technical students, reported by 83 percent of respondents. Demonstrating these competencies may require passing a test, passing a prerequisite academic course, or taking a co-requisite academic course along with a vocational course. While this is a rather traditional form of integration, it does help assure that occupational/technical students have academic skills that can be applied to vocational subjects. Vocational courses in secondary schools usually do not have such requirements. (There is a debate at both levels over whether such requirements discriminate against special population students.) Often these required general education competencies are tailored to specific occupational courses, a result of participation by vocational faculty in establishing the requirements. Somewhat over half (58%) of the postsecondary institutions in the survey said that occupational faculty were involved in establishing general education competencies.

The area in which secondary districts moved more vigorously than postsecondary institutions after the passage of the Perkins Act was teacher training. Before the Perkins Act, about the same proportion of secondary districts and postsecondary institutions were providing training in integration: 32 percent made training available to vocational faculty and 21–24 percent made it available to academic faculty. After Perkins, the proportion of secondary districts providing training approximately doubled, while the proportion of postsecondary institutions doing so increased by a little less than half. This difference at the local level may reflect the marked difference in emphasis on integration training that characterizes secondary and postsecondary state agencies. For example, 71 percent of secondary state agencies say that they provide in-service training on integration for academic teachers; only 18 percent of postsecondary state agencies do so.

In addition to these efforts, the great majority of postsecondary institutions have taken steps to improve or broaden the academic skills of vocational students by providing remedial/developmental education. Indeed, remedial coursework to prepare high school graduates for postsecondary education is one of the established features of most community colleges.

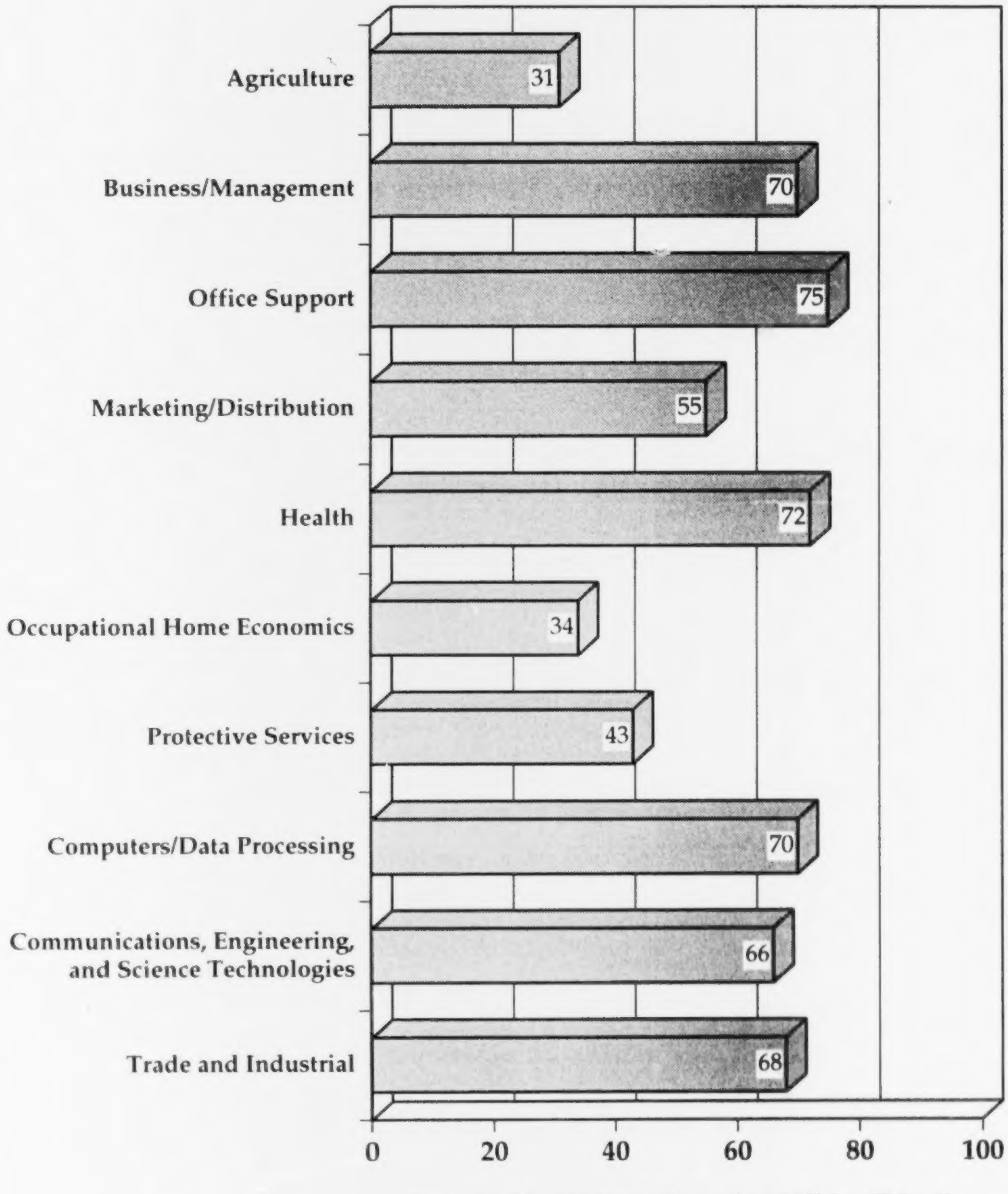
The survey data also provide information on the extent of integration in different program areas. Figure 12.2 shows the proportions of postsecondary administrators reporting steps to integrate that said their institutions had taken "all" or "most" of the integration steps in a given program area. The distribution of integrated subjects in postsecondary institutions resembles that at the secondary level in some ways but differs in others. In both secondary and postsecondary schools, integrated courses in business/office education and trade/industrial education were widespread. However, integrated courses in health, computers/data processing, and communications, engineering, and science technologies were widespread in postsecondary schools but not in their secondary counterparts. (These subjects also have a larger share of postsecondary than of secondary enrollments.)

As at the secondary level, collaboration between academic and vocational faculty is an important and often essential element in integration. Virtually all of the postsecondary institutions that reported steps to integrate also reported that some of their academic and vocational faculty are working together to develop or implement integrated courses. A median of eight vocational and five academic faculty were reported to be working together in this way. This is more than at the secondary level (median four academic and four vocational teachers), but the postsecondary institutions are also larger.

Figure 12.3 indicates what postsecondary faculty and their secondary counterparts are working on in their efforts to integrate. The dominant approach in postsecondary institution, as in secondary schools, is modifying existing courses, and there is a greater tendency to modify vocational than academic courses. Nevertheless, postsecondary institutions are somewhat less likely than secondary schools to take this approach and more likely to be developing new courses. About half of the postsecondary institutions reported that faculty are working on new courses, as compared to about one-third of the secondary schools. Some 32 percent of postsecondary institutions and 23 percent of secondary schools indicated that faculty are developing tandem courses that link academic and vocational disciplines.

Again in contrast to the secondary pattern, there were remarkably few differences in 1990–91 or 1991–92 between the comprehensive postsecondary institutions (community colleges) and the vocational postsecondary institutions (technical institutes and area vocational schools primarily serving postsecondary students) in the likelihood of taking steps to integrate (Appendix Table A-12.2). For eight of the ten possible steps listed, the differences were less than 7 percent.

Figure 12.2
Concentration of Integration Activities by Postsecondary Institutions in Given Program Areas



Source: Omnibus Survey of Postsecondary Institutions

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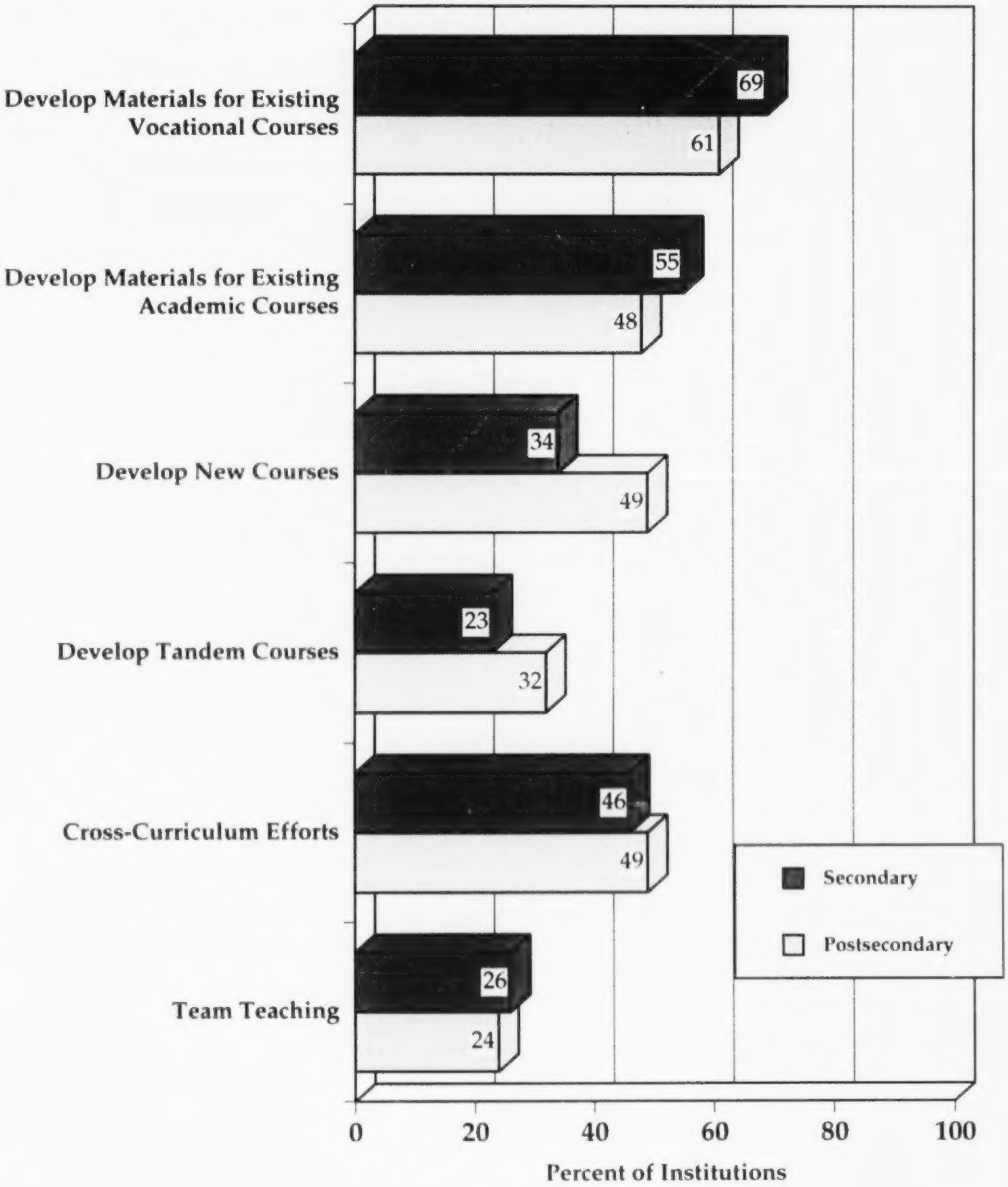
Figure 12.3
Ways in Which Faculties Work Together to Integrate Academic and Vocational Education



Source: Omnibus Survey of Secondary Schools and Postsecondary Institutions

Only in two areas were there differences worth noting. First, community colleges were much more likely than postsecondary vocational schools to use cross-curriculum materials, such as Writing Across the Curriculum. This difference may reflect a greater tendency in the comprehensive institutions to emphasize academics. Second, postsecondary vocational schools were somewhat more likely to use applied academics or other integrated materials from commercial vendors such as CORD and AIT. This difference may reflect the fact that most area vocational schools serving postsecondary students also have secondary students, who are the principal audience of commercial vendors of these materials.

Funded vs. Unfunded Institutions. Integration efforts at the postsecondary level are not as closely related to Perkins funding as they are in secondary districts (see Appendix Table A-12.3). In every category of activity, secondary districts receiving basic grants are more likely than non-recipients to have taken steps to integrate. The differences average 12 percent for regular districts and 9 percent for vocational districts. However, funded community colleges are more likely than unfunded colleges to have taken steps to integrate in only eight of ten possible categories, with an average difference of 6 percent. Among postsecondary vocational institutions, **unfunded** schools are often as likely as funded schools to report having taken steps to integrate. Among the vocational institutions, Perkins funding seems to be doing little, if anything, to promote integration.

The Depth of Postsecondary Integration

In some ways efforts to integrate curricula in postsecondary institutions seem to be further along than at the secondary level, although there are problems. We saw earlier that postsecondary institutions are more likely than their secondary counterparts to be working on cross-curriculum integration efforts and to be developing new integrated courses. Moreover, postsecondary occupational programs are more likely to relate academic and vocational coursework by requiring academic prerequisites, co-requisites, or tests of competency as conditions for enrollment in vocational courses.

In addition, divisions between academic and vocational faculty seem to be less a problem than at the secondary level. It is not much of an issue in the case studies, and occasionally we read statements to the effect that "at the community college, a great deal of interaction occurs between academic and vocational instructors."

On the other hand, postsecondary faculty are no more likely than secondary teachers to have formal planning time for integration. Only about one-fourth of postsecondary institutions reported setting aside regularly scheduled time for teachers to meet on integration issues. Further, like secondary teachers, those who meet are most likely to be developing materials for existing vocational courses.

THE POTENTIAL OF INTEGRATED EDUCATION

Although it is much too early to determine the effectiveness of integrated academic and vocational curricula, it is possible to assess its potential. Over the last decade, many educational researchers have become convinced that learning in context is more effective than traditional ways of learning, such as through lectures and textbooks. Applied learning is one form of contextual education, and vocational/academic integration is one form of applied learning. Therefore an assessment of the potential for integrated education should examine the theory of contextual learning and the empirical evidence of its effectiveness.

Contextual Learning

A review of the literature by Karweit describes contextual learning and assesses its effectiveness. Karweit[20] expresses the core of the idea as follows:

> The traditional view of learning as abstract and generalizable is challenged by a new view of cognition as situated and specific. Rather than seeing knowing as something that is true for all time and all places, knowledge is seen to be dependent upon and embedded in the contexts and activity in which it takes place. Schools, by abstracting learning from use in an attempt to promote generalization, create unusable or inaccessible knowledge.

In comparing learning in and outside of school, Resnik, the leading theorist of contextualized education, identified four ways in which she thinks schools are dysfunctional for learning [21] First, learning in schools is individually arranged, while in out-of-school work settings learning is shared. Second, schools emphasize unaided thought, without extensive tools and materials, while situations outside of school encourage the use of available tools. Third, schools emphasize abstraction and symbol manipulation, while real life usually requires reasoning connected to actual events and objects. Finally, schools try to teach general skills and theoretical principles, while outside of school, people usually need situationally specific, relevant knowledge.

Resnik and other advocates of the contextualized approach cite examples of people who can perform fairly complex mathematical calculations to solve real-life problems but cannot solve the same problems in the abstract, or outperform others who can. Child street vendors in Brazil, for example, used creative mathematical approaches to solve problems in their sales but could not solve the same problems using abstract theorems and a pencil-and-paper approach. Along the same lines, construction workers outperformed eighth-grade students in solving scale problems on architects' drawings. The construction workers relied on their experience in using the drawings, while the students relied on the algorithms they had been taught.

Contextualized learning's critique of traditional education has generated proposals for "cognitive apprenticeships" in which novices (students) gain experience and understanding by working on projects under the mentorship of experts. In Karweit's terms, "the process of gaining experience in apprenticeships is one of observation, coaching, and practice guided by experts as the apprentice learns particular skills." The novice learns through "successive approximation of mature practice," and "learns generality by [the] observation and experience of particulars."[22]

These are intriguing and intuitively appealing theories, but is there systematic evidence that they work? Do children learn better in contextual education than in traditional education? Some empirical research suggests that they do.

Education researchers at Vanderbilt University have conducted many experiments to test the effectiveness of a method called "anchored instruction." Essentially this approach uses videodiscs to engage children in stories and simulated situations, which serve as "anchors" for learning. That is, they provide the context within which children can observe and learn from situations, identify and solve problems, and so forth. In repeated experiments, students using the videodiscs outperformed control students in writing assignments, knowledge tests, and reasoning problems. They also had more positive attitudes toward math. At-risk students, in particular, seemed to benefit most from the anchored instruction approach.[23]

A second type of contextualized learning, called "functional context education," was developed for use in military training. The Army's 20-week course on radio repair, the first formal use of the functional context training model, starts with specific issues, questions, and problems in radio repair and moves to general theory. Only the theory needed to make a particular repair is taught. To avoid overwhelming trainees, the amount of information to be conveyed in training was reduced and carefully tailored to the content needed and the time available. In random-assignment experiments, functional context trainees far outperformed controls in hands-on performance tests such as troubleshooting, use of test equipment, and repair skills, although they did no better on paper-and-pencil multiple choice tests. (Parallels with the Brazilian street vendors are intriguing.)

This experiment and others reviewed by Karweit found that the functional context training method reduced training time, reduced training attrition rates, and improved the performance of trainees. Not surprisingly, the military has made extensive use of functional context training in the 30 years since these first experiments were conducted.

The success of functional context training led the Army to adapt the approach for use in adult literacy projects. The Functional Literacy project (FLIT) related reading to task performance in various occupational areas (cook, clerk, etc.). It also moved from the particular to the general and focused on real-life applications. FLIT was composed of two modules: reading-to-do, which teaches recruits how to use manuals and other sources to look up information; and reading-to-learn, which teaches them how to read in order to understand information that will help on the job. In controlled studies, FLIT trainees showed greater gains in job-specific reading than did comparison groups that used general literacy models. However, the group differences were of borderline statistical significance (between $p<.05$ and $p<.10$), and the results can only be regarded as suggestive.

In general, there is experimental evidence that components of contextualized learning are more effective than traditional instruction. However, the experiments on anchored learning seem far afield from integrated vocational/academic education. They took place in traditional classrooms and tended to be very "academic," involving the manipulation of symbols, reading, writing, and taking tests. The Army's functional context approach comes closer to "hands-on" integrated education. However, this approach involves teaching and learning highly task-specific skills through the transfer of a very limited body of knowledge. Is there evidence from schools that integrated academic and vocational courses, or curricula, are superior to traditional teaching methods? The next section addresses this question.

Effectiveness of Academic/Vocational Integration

Stasz's study found that although the literature on integration contains much descriptive and anecdotal information, research on outcomes is sparse, and many of the quantitative studies have methodological problems that call their conclusions into question.

Quantitative Studies

Stasz reviewed ten studies that related student test scores to participation in Applied Math, Applied Communications, and Principles of Technology courses.[24] Of the ten studies, four were based on opinion surveys of teachers and students who completed applied academics courses. The findings indicated that teachers and students held generally positive views of the courses. However, the surveys were limited to opinions and have a variety of problems related to design, sampling, and/or analysis. Taken together, they do not tell us much about the effectiveness of the courses.

Three of the ten studies tested students before and after completing Applied Math and Applied Communications courses. The students' test scores increased from the beginning to the end of the courses. However, since there were no comparison groups, it is impossible to tell whether the students would have done better, worse, or about the same in regular classes.

The remaining three studies were better designed and produced results that could be called suggestive. Two studies involved the administration of pre- and post-course tests to Applied Math students and to comparison groups of students in other math courses. In one study, the students in the Applied classes registered bigger test-score gains than the comparison students in "regular" math classes. In a second study, students in the Applied course outperformed those in "general" math. Applied Math students in the second study also had about the same test score gains as a comparison group of students in Algebra I. If we assume that the "regular" math course was less demanding than Algebra I, the results of the three comparisons are consistent. However, both studies have methodological problems that prevent us from reaching a firm conclusion about the effectiveness of these materials.

The last of the ten studies tested students in a Principles of Technology class and comparison groups of students in chemistry and biology. The Principles of Technology students did better on the science subtest of the Stanford Achievement test than the chemistry and biology students, controlling for differences in general achievement as measured by other parts of the test. Once again, methodological problems such as lack of random assignment and baseline tests mitigate the conclusions, but the study seems to provide some evidence of the effectiveness of Principles of Technology.

Career Magnets and Career Academies

Two forms of integration on which good empirical research has been conducted are career magnet schools and career academies. These are schools, or programs within schools, each of which has an occupational theme and a curriculum devoted to preparation in a specific occupational field. Research on magnet schools has been conducted in New York City, and research on career academies, at various sites in California and Philadelphia. Initial results suggested that both kinds of initiatives had positive effects on student achievement and retention. However, followup studies showed few, if any, additional gains.

New York City has eight career magnet schools and a number of magnet programs in comprehensive high schools. The magnet schools include Aviation High School, the High School of Fashion Industries, and the Murray Bergstrom High School for Business Careers, among others. Career magnets are not necessarily integrated at the level of individual courses. Standard English and history classes are usually still taught. Nevertheless, the programs are integrated in the sense that they have a career focus and presumably help create a community of purpose among students and teachers.

The academies are similar to the New York magnet programs in comprehensive high schools, although they tend to recruit potential dropouts, and retention is one of their major goals. As in the New York programs, there is some integration of academic and vocational subjects at the course level, though many traditional academic courses are still taught.

Crain and associates[25] took advantage of random (lottery) selection into New York magnets to conduct a natural experiment. They compared educational outcomes for lottery winners (who were admitted to magnet schools and programs) and lottery losers (who pursued a regular education in comprehensive high schools).

Their initial research on ninth-graders found that winners of average reading ability (a) were less likely to drop out of school between the eighth and ninth grades; (b) gained more in reading scores; and (c) earned more credits toward graduation than their counterparts in comprehensive high schools. Below-average readers in the magnet schools (a) were also less likely to drop out between the eighth and ninth grades; (b) were more likely to pass the advanced mathematics test required for the New York State Regents diploma; but (c) were also more likely to be absent than their below-average counterparts in the comprehensive high schools.

Unfortunately, most of these promising results were not found in a second study of the cohort conducted one year later. Preliminary results indicate no significant differences between the lottery winners and losers in the 10th grade, except in dropout rates, which were still lower in the magnets.[26]

Studies of California academy students and matched comparison students in the same high schools have generally found lower dropout rates among the academy students.[27] One study of nine California Peninsula academies also found that academy students had better attendance, took more course credits, had higher grade-point averages, and failed fewer courses than students in the matched samples. However, in a pattern similar to New York's, the effects were strongest in the students' first year, they declined in the second, and they disappeared in the third. Nevertheless, some first-year gains, such as reduced course failures, were not lost. Follow-up studies of graduates of two Peninsula academies and comparison students 27 months later found no significant differences in labor market outcomes such as employment status, wages, or hours worked.

We do not know why these effects faded. One possible reason is that the students were energized by their new school environments, worked harder, and performed better than others, but that their enthusiasm wore off in later years. There are no data on student employment outcomes for the New York magnets, and the magnets may still prove to be relatively effective at preparing students for the labor market. While the results of the research to date do not offer much systematic empirical evidence for regarding career magnets and academies as promising models of integration, these systems may have some postive effects on retention. More research on this subject and on employment outcomes would help in assessing their performance.

INSTRUCTION IN "ALL ASPECTS OF THE INDUSTRY"

Instruction in "all aspects of [an] industry" is a form of integration that, potentially, combines skill training with a variety of academic approaches to understanding industry (e.g., its context, history, organization, processes). The Perkins Act authorizes the use of Title II funds for "programs which train adults and students for all aspects of the occupation, in which job openings are projected or available." Elsewhere, the Act strongly encourages the development of programs that educate students in all aspects of an industry.

Supporters of this form of education argue that it will provide a number of benefits. First, it might promote entrepreneurship by giving students the skills they need to start their own businesses. For example, if they had an overview of their industry, some basic accounting, and the essentials of investment, personnel management, and related skills, vocational completers in auto mechanics, cosmetology, or landscape design would have the fundamentals necessary to start small businesses.

Second, education in all aspects of an industry might broaden the scope and increase the level of a student's skills and abilities, facilitating career development and upward mobility within organizations. Specifically, it could give students some of the skills they would need to move into management roles at some point.

Third, education in all aspects of an industry might be more appropriate than traditional education for the newer forms of work organization that are emerging in business and industry. For example, "high-performance workplaces" often involve job rotation, which requires the use of multiple skills.

Fourth, the development of a broader range of skills seems appropriate for employment patterns involving multiple career changes. The more skills one has, the greater one's ability to navigate these changes.

While these are reasonable arguments, we do not have empirical evidence that education in all aspects of an industry actually provides such benefits. The idea, at least in its current form, is relatively new and has not been widely adopted, nor have programs been systematically evaluated. However, we do have data from the Omnibus Surveys on the implementation of "all aspects" education at the state and local levels.

Implementation of "All Aspects of the Industry"

States, districts, and schools are just beginning to develop curricula and prepare for instruction in all aspects of [an] industry. This provision of Perkins has not been as much a part of the discourse in vocational education as integration or tech prep, and administrators working on the subject seem to be starting from the ground up.

The extent to which state agencies had taken various steps to promote instruction in all aspects of the industry by Spring 1992 is shown in Appendix Table A-12.4. Relatively small proportions (14–25% for secondary school agencies) had done so. For example, one-fourth had developed recommended curriculum guidelines for local plans, and one-fifth had provided in-service training to teachers. However, a majority of states (59%) said they planned to take at least some action to promote instruction in all aspects of the industry the following year.

About one-quarter of regular districts said that state support for an "all aspects" agenda had increased in the last year (see Appendix Table A-12.5). However, only about one-tenth said that state support is "very good." An even smaller proportion—4 percent—reported using Perkins funds to develop curricula in all aspects of the industry. Vocational districts are only a little more likely to say they had received "very good" state support or that state support had increased.

However, Perkins funding is related to local implementation. With one exception, funded districts were about twice as likely as unfunded districts to indicate positive state support for developing "all aspects of the industry" curricula. For example, 28 percent of funded regular districts, but only 14 percent of unfunded regular districts said that state support for "all aspects" increased from 1990–91 to 1991–92. (The one exception is the equal proportions of funded and unfunded vocational districts indicating increased support in that period.)

Secondary schools may be a little more active than states and districts in moving toward "all aspects" instruction, even though the term is not used. By Spring 1992, about one-quarter of the schools surveyed had expanded their courses to include instruction in technology and production skills, underlying principles of technology, and health and safety issues. A slightly smaller proportion (22%) included instruction in environmental issues. Still smaller proportions, ranging from 13 to 15 percent, had taken steps to provide instruction in planning and management, finance, and labor and community issues.

It is not clear why these schools have expanded their vocational offerings to include a range of industry-wide topics, but it seems unlikely that the changes are primarily a response to the Perkins Act, given the low level of state and district involvement in the subject. No doubt many of the schools that reported teaching underlying "principles of technology" were using the CORD package of the same name. Beyond that, it may be that some of the curricular changes in these schools reflected broader changes in the economy and labor market.

Instruction in all aspects of the industry is even less a priority at the postsecondary than at the secondary level (see Appendix Table A-12.4). The proportions of states that had taken any of the actions listed ranged from 4 to 15 percent, depending on the item. Among community colleges and technical institutes, 5 percent indicated that they are using Perkins funds to develop "all aspects" curricula—about the same as at the secondary level.

There is one important exception to the generalization that the development of curricula in all aspects of the industry is very limited. Some 35 percent of postsecondary institutions and 27 percent of high schools are developing "all aspects" curricula for use in tech-prep programs. That is approximately half of the postsecondary institutions and secondary districts that are developing such programs.

In all, secondary state agencies and districts have done little to implement instruction in all aspects of the industry, and postsecondary institutions have done even less. This lack of response may be due in part to the relatively low visibility of this issue in the national debate on vocational education reform.

However, a small core of districts, with state support, seems to be actively pursuing this agenda. Funded districts are much more likely than unfunded districts to indicate state support for their efforts. Further, a sizeable minority of schools—on the order of one-third—are expanding their course offerings to include a broader range of industry-related subjects, and "all aspects" instruction seems to be a significant element in tech-prep planning.

At present, instruction in all aspects of an industry is ill-defined and, if taken literally, would not be feasible. A better operational definition of the concept and its applications is needed.

CONCLUSION

The integration or separation of academic and work-related curricula has a long history in American education. Over the years, federal policy has fostered and supported the separation of academic and vocational education. The 1990 Perkins Act is beginning to change that tendency by requiring that grant recipients integrate academic and vocational curricula.

State secondary agencies have undertaken a wide range of initiatives to support integration; state postsecondary agencies are less active, but are increasing their efforts. Many local districts and postsecondary institutions are also taking a range of steps to integrate. Vocational districts and those receiving Title II Perkins funds are more active than others. Perkins funding is also related to increased integration activity, more at the secondary than the postsecondary level.

Although secondary integration efforts are widespread, they lack depth. Districts seem to be taking an adaptive approach to the Perkins requirement to integrate, modifying existing courses and integrating on an ad hoc basis, rather than pursuing systemic reform. While most districts report collaborative efforts between academic and vocational teachers, few provide release time for these activities. Very few academic and vocational teachers coordinate curricula with each other. Moreover, there is often strong resistance to integration from teachers, especially those on the academic side.

The level of instruction and the quality of materials in integrated secondary courses should be subjects of systematic research. Anecdotal and some research evidence suggests that much integrated education occurs at a very low, almost remedial level.

In postsecondary institutions, there is somewhat more depth to the integration. Some of the depth comes from the longstanding practice of having academic prerequisites and co-requisites for enrollment in occupational courses. Some of it comes from the greater tendency of postsecondary institutions to create new integrated courses and to integrate across curricula. However, as at the secondary level, postsecondary faculty generally lack time to pursue integration.

Despite shortcomings in implementation, integrated education seems to have potential as an instructional approach. There is some empirical evidence that contextualized education was more effective than traditional academic education in learning both academic and (in the military) occupational skills. There is little evidence so far that integrated academic/vocational education in schools is more effective than other approaches. However, not much good evaluation research has been done on the subject.

ENDNOTES

[1] Kantor, H. (1982), Vocationalism in American education: The economic and political context, 1880–1930. In Kantor, H., & Tyack, D., *Work, Youth , and Schooling: Historical Perspective on Vocationalism in American Schooling*, p. 15: Stanford, CA: Stanford University Press. The discussion of the development of vocationalism is based primarily on this book.

[2] Kantor & Tyack, p. 35.

[3] Ibid., pp. 33, 85.

[4] The functions of the board were incorporated in the U.S. Office of Education in 1933, and the board itself was abolished in 1946.

[5] National Commission on Excellence in Education (1983). *A Nation at Risk*. Washington, DC: U.S. Department of Education.

[6] National Committee on Secondary Vocational Education (1984). *The Unfinished Agenda: The Role of Vocational Education in High School*. Columbus, OH: The National Center for Research on Vocational Education.

[7] See Appendix 12-A for a description of these reports.

[8] Wirt, J.G., et al (1989). *Summary of Findings and Recommendations, National Assessment of Vocational Education* (Vol. 1), p. xiii. Washington, DC: U.S. Department of Education.

[9] Kantor, pp. 14–31.

[10] Resnik, L.B. (1987). The 1987 presidential address: In school and out. *Educational Researcher*, December 1987.

[11] Adelman, N.E. (1989). *The Case for Integrating Academic and Vocational Education*. Washington, DC: Policy Study Associates.

[12] Stasz, et al. (1992). Integrating Academic and Vocational Education: A Review of the Literature, p. 8. Draft report prepared for the National Assessement of Vocational Education. Santa Monica, CA: RAND.

[13] Ibid., pp. 9–12.

[14] Grubb, W.N., & Kraskouskas, E. (1992). *A Time to Every Purpose: Integrating Academic and Occupational Education in Community Colleges and Technical Institutes*. Berkeley, CA: National Center for Research in Vocational Education.

[15] See Appendix 12-C for a description of these reform initiatives.

[16] Stasz, et al., pp. 28 ff.

[17] Some 93 percent and 84 percent of secondary and postsecondary agencies, respectively, said that state vocational officials support such efforts, while 46 and 49 percent said that state academic officials do.

[18] Stasz, et al., pp. 7, 17.

[19] Wirt, et al., p. 82

[20] Karweit, N. (1993). Contextual Learning: A Review and Synthesis. Draft report prepared for the National Assessment of Vocational Education. Baltimore, MD: Center for Social Organization of Schools.

[21] These points are taken from Karweit. The study to which she refers is L.B. Resnik, "The 1987 Presidential Address: Learning in School and Out." *Educational Researcher*, December 1987, pp. 13–20.

[22] Karweit, p. 7.

[23] Another contextual learning approach, called reciprocal learning, has been shown effective in improving reading test scores in repeated experiments.

[24] Stasz, et al. The course materials were developed by the Center for Occupational Research and Development (CORD).

[25] Crain, R.L. et al. (1992). *The Effectiveness of New York City's Career Magnet Schools: An Evaluation of Ninth Grade Performance Using an Experimental Design*. Berkeley, CA: National Center for Research in Vocational Education.

[26] Conversation with Robert Crain, November 1993.

[27] See Stasz, et al., pp. 27ff. Also see Stern, D. (1993), *The School to Work Transition and the Relevance of Vocational Education to Subsequent Employment*. Draft report prepared for the National Assessment of Vocational Education. Berkeley, CA: National Center for Research in Vocational Education.

CHAPTER 13

TECH-PREP PROGRAMS

INTRODUCTION

The origins of the tech-prep movement were discussed in Chapter 10 on education reform. In the early 1980s a few community colleges had developed programs that articulated secondary and postsecondary curricula, and the idea of a program combining two years of secondary and two years of postsecondary education was being discussed among small groups of educators.

The publication in 1983 of *A Nation at Risk*,[1] a key document in the broader education reform movement, crystallized sentiment among those concerned about the education of high school students who were not headed for four-year colleges. Among these was Dale Parnell, then executive director of the American Association of Community and Junior Colleges. In 1985 Parnell wrote *The Neglected Majority*,[2] which argued that *A Nation at Risk* was keyed to the interests of the 25 percent of high school students who would eventually graduate from four-year colleges, largely ignoring the majority of high school students who were not likely to complete or even enter college.

Parnell proposed a three-track curriculum for high schools: a college-bound academic program for the top quarter of students, in terms of academic interest and ability; an occupationally oriented tech-prep or two-plus-two program for the middle half; and a vocational program for the bottom quarter. The amorphous general education track, which he called "the academic and vocational wasteland of American education," would be eliminated.

The tech-prep program would prepare students for jobs in the rapidly expanding mid-level technical sector of the economy. In Parnell's view,

> The four-year 2+2 tech prep associate degree program is intended to run parallel with and not replace the current college-prep/baccalaureate program. It will combine a common core of learning and technical education and will rest upon a foundation of basic proficiency development in math, science, communications, and technology — all in an applied setting...Beginning in the junior year in high school, students will select the tech-prep program and continue for four years in a closely coordinated high school/[community] college curriculum.[3]

Tech-prep initiatives have expanded rapidly since Parnell put this proposal on the national agenda. *The Neglected Majority* could cite only a handful of two-plus-two programs in the mid-1980s, but Omnibus Survey data indicate that by 1990 over a thousand school districts and hundreds of community colleges had combined to begin developing tech-prep programs.

THE ELEMENTS OF TECH PREP

Within the two-plus-two framework, tech-prep programs have a number of key elements. One such element, the articulation agreement, links secondary and postsecondary institutions to provide a closely coordinated high school/college curriculum. At its most basic level the articulation agreement coordinates courses in the two institutions to assure that their content and level are compatible. They may be compatible (a) in the sense that a secondary course prepares a student for a postsecondary course, or (b) in the sense that a secondary course is equivalent to a postsecondary course and that a high school student can receive advanced placement credit for completing it.

Although course articulation is essential to tech-prep programs, it is more of a building block than a finished product. The tech-prep model envisions the articulation not just of single courses but of programs — series of related courses — at the two educational levels. As usually understood, a fully developed tech-prep program should have an articulation agreement that covers a progressive, non-duplicative sequence of secondary and postsecondary courses leading to an associate degree in a career field.

A tech-prep program must also provide a common core of proficiency in math, science, communications, and technology in an applied setting. That is, it must not only provide a solid technical education, but do so through the integration of academic and occupational curricula. Some educators also regard work experience programs, such as co-op or apprenticeship, or other links between school and work as essential elements of tech prep.

The Perkins Act defines tech prep as a "combined secondary and postsecondary program which:

> (A) leads to a two-year associate degree or two-year certificate;
>
> (B) provides technical preparation in at least one field of engineering technology, applied science, mechanical, industrial or practical art or trade, or agriculture, health, or business;
>
> (C) builds student competence in mathematics, science, and communications (including through applied academics) through a sequential course of study; and
>
> (D) leads to placement in employment."[4]

In an effort to encourage the development of tech-prep programs, Title III, Part E of the Perkins Act, called the "Tech-Prep Education Act," authorizes funds

> (1) to provide planning and demonstration grants to consortia of local educational agencies and postsecondary educational institutions, for the development and operation of 4-year programs designed to provide a tech-prep education program leading to a two-year certificate; and
>
> (2) to provide, in a systematic manner, strong, comprehensive links between secondary schools and postsecondary educational institutions.

This chapter examines the development of tech-prep programs at the state, local secondary, and postsecondary institutional levels. The basic questions include the following: How are states responding to the Perkins Tech-Prep provisions? How do states allocate tech-prep funds? How widespread are tech-prep programs? How much depth do they have? What vocational programs are most likely to be included in tech prep? Do special populations have equal access to tech-prep programs?

State Programs and Initiatives

The Omnibus Survey asked administrators of state agencies responsible for tech-prep programs whether each of the elements in the Perkins definition of tech prep was required in order to award a Title III Tech-Prep Grant to an applicant.[5] In addition, the survey asked about other elements of well-developed tech-prep programs: the integration of vocational and academic curricula, and a competency-based curriculum.

The percentage and number of states requiring each of these elements as a condition for tech-prep funding are shown in Table 13.1. Virtually all states (47–48 of the 49 responding to the survey) reported that most of the major elements of the Perkins definition of tech prep were required for districts or postsecondary institutions to receive Perkins Title III funding. These included an articulation agreement; a structured sequence of courses; the goal of a two-year associate degree or certificate; technical preparation in engineering technology, applied science, or other related fields; and the integration of vocational and academic curricula at the secondary level.

Slightly smaller numbers of states (43–44 out of 49) required demonstrated student competence in math, science, or communications and integration at the postsecondary level. Since "a common core of required proficiency in mathematics, science, communications, and technologies" is a funding requirement in the Perkins Act, it seems that a small number of states are not in compliance with the law in this respect.

Table 13.1
State Requirements for Tech-Prep Grants
(Percent of States With Requirement)

Requirement	Percent (Number)
An articulation agreement between secondary and postsecondary institutions	98 (48)
Structured sequence of courses covering two years of secondary and two years of postsecondary education or apprenticeship	98 (48)
The goal of an associate degree or two-year certificate	98 (48)
Technical preparation in engineering technology; applied science; mechanical, industrial, or practical art; agriculture; health; or business	96 (47)
Integration of vocational and academic curricula at the secondary level	96 (47)
Demonstrated student competence in math, science, and communications	90 (44)
Integration of occupational/technical and general or transfer curricula at the postsecondary level	88 (43)
A competency-based curriculum	71 (35)
Placement in employment	61 (30)

Source: Omnibus Surveys of Secondary and Postsecondary State Agencies

The elements required by the fewest states are a competency-based curriculum (35) and placement in employment (30). Because a competency-based curriculum is not a Perkins requirement, the fact that only 71 percent of the states require it for tech prep is not particularly disturbing.

The relatively weak emphasis on placement in employment may or may not be a problem. On the one hand, it is a requirement of the legislation, and if tech-prep programs do not lead to job placement, much of their value may be lost. On the other hand, many of the funding applications that states review are for tech-prep programs that do not yet have students. For these programs, it would be unrealistic to require job placement within the four years covered by the grant.

Of course, the states' relatively strong showing on these requirements can be many steps removed from the reality of functioning tech-prep programs. First, many of the tech-prep applications are for grants to initiate new programs or to develop programs still in their infancy. Hence, requiring certain program features as a condition of funding often means that the applications contain **plans** to incorporate these features in the future, rather than evidence that they already exist. Second, in cases where actual tech-prep programs are funded, there is no assurance that state requirements are really being met. Third, the administrators responding to the survey are presumably familiar with the requirements of the Perkins legislation and would be averse to reporting non-compliance.

STATE ALLOCATION OF TECH-PREP FUNDS

Let us examine briefly the process of allocating Title III Tech-Prep Grants: the methods of awarding them, the average amounts awarded, and the types of recipients.

Under the provisions of the Perkins Act, Tech-Prep Grants to local consortia may be awarded competitively or on the basis of a formula determined by the state board. In fact, the great majority of states — 88 percent — make competitive awards. Only 6 of the 49 states responding awarded tech-prep funds through formulas. In the states where awards are competitive, the competition for grants could be characterized as real, but not fierce: Two-thirds of the applications received were funded in 1991–92.

An average state had slightly less than $1 million of Perkins Title III money to award for tech-prep grants, and it made 13 awards of about $75,000 each to tech-prep consortia.[6] Perkins money constituted the bulk of non-local funding for tech-prep consortia: Only 7 of the 49 states provided separate state funding. However, among those seven, the mean amount available for tech-prep was substantial — $545,296, or more than half the mean amount of Perkins funds available. Typically these reformist states had started allocating the funds in the year before the passage of the Perkins Act. After passage, state funds were typically combined with Perkins money in awards to consortia.

Community colleges are the institutions most likely to receive Title III tech-prep funds. Nationwide, 42 percent of community colleges received funds in 1991–92, as compared to 9 percent of regular school districts and 19 percent of vocational districts. However, because of the greater number of school districts, more districts than community colleges received tech-prep money — about 1000 school districts and 500 community colleges in 1991–92.

CHARACTERISTICS OF TECH-PREP SITES

It will be useful to examine some of the characteristics of school districts and postsecondary institutions that report having tech-prep initiatives, and the characteristics of Title III Tech-Prep Grant recipients.

At the secondary level, tech-prep initiatives tend to be located in large urban districts, vocational districts, and districts that receive Perkins Title II Basic Grant funds. (See Tables 13.2 through 13.5.) (In general, districts with these characteristics are among the most active and involved in responding to most provisions of the Perkins legislation.) With one qualification, the same kinds of districts are also the most likely to receive Title III Tech-Prep Grants (Table 13.6). Large regular districts are more likely than small ones to receive Title III funds, but among vocational districts, size makes less of a difference. Only the smallest districts are less likely than others to receive Tech-Prep Grants.

At the postsecondary level, large institutions are more likely than small ones to report having tech-prep initiatives (Table 13.7). However, whether school size is related to Title III tech-prep funding depends on the type of institution. Large community colleges are no more likely than small ones to receive grants. However, among postsecondary **vocational** schools, the larger institutions do have a greater probability of receiving grants (Table 13.7).

Table 13.2
Regular and Vocational Districts Having or Planning Tech-Prep Programs by Basic Grant (Title II) Funding Status
(Percent)

	Regular		Vocational	
Tech Prep	Funded	Unfunded	Funded	Unfunded
Started before 1991–92	28	13	65	54
Started in or continuing in 1991–92	49	32	84	80

Source: Omnibus District Surveys, Version B and Vocational

Table 13.3
Regular Districts Having Tech-Prep Initiatives, 1991–92
By Size of District (Percent)

Student Enrollments	Percent
Less than 1000	30
1000–2499	35
2500–4999	49
5000–9999	67
10,000–24,999	66
25,000 or more	85

Source: Omnibus District Survey, Version B

Table 13.4
Regular Districts Having Tech-Prep Initiatives, 1991–92
By Urbanicity of District (Percent)

	Percent
Urban	73
Suburban	39
Rural	39

Source: Omnibus District Survey, Version B

Table 13.5
Vocational Districts Having Tech-Prep Initiatives, 1991–92 by Size of District (Percent)

Student Enrollments	Percent
Largest quartile	87
Third quartile	90
Second quartile	76
Smallest quartile	71

Source: Omnibus District Survey, Version B

Table 13.6
Districts Receiving Title III Tech-Prep Funds by Size of District (Percent)

Regular		Vocational	
Student enrollments			
Less than 1000	3	Largest quartile	22
1000–2400	10	Third quartile	27
2500–4999	16	Second quartile	21
5000–9999	12	Smallest quartile	6
10,000–24,999	12		
25,000 or more	32		

Source: Omnibus District Surveys, Version B and Vocational

Table 13.7
Postsecondary Institutions Reporting Tech-Prep Initiatives and Receiving Title III Tech-Prep Funding by Size of Institution (Percent)

Student Enrollments	Community Colleges	Vocational Institutions
Initiatives		
Largest quartile	82	64
Third quartile	79	64
Second quartile	77	50
Smallest quartile	66	35
Title III funding		
Largest quartile	42	39
Third quartile	44	38
Second quartile	42	22
Smallest quartile	39	6

Source: Omnibus Survey of Postsecondary Institutions

THE IMPLEMENTATION OF TECH PREP

How far along are local education systems in developing and implementing tech prep? At first glance, tech-prep programs seem to be booming. Approximately two-thirds of all public two-year postsecondary institutions (three-fourths of all community colleges) said they had started tech-prep programs by 1991–92. At the secondary level, 41 percent of regular districts and 82 percent of vocational districts reported having initiated programs at the time of the survey.[7]

Strong majorities of the districts and postsecondary institutions reporting tech-prep programs said they had taken major steps to implement tech prep, and the percentages having taken these steps increased dramatically between 1990–91 and 1991–92. More than two-thirds of all districts reported taking seven out of ten major steps to develop tech-prep programs, (Appendix Tables A-13.1 and A-13.2). When asked to report on tech-prep developments in each program area, most districts reported providing teacher and counselor training for tech prep, and most said that business and industry were involved in the development of their tech-prep programs (Tables 13.8 and 13.9).

Table 13.8
Tech-Prep Programs in Regular Districts, 1991–92 by Program Area

	Agriculture	Business/ Office	Marketing	Occupational Home Economics	Health	Trade & Industrial
Median year of actual or planned implementation	1992	1992	1992	1992	1992	1992
Median number of secondary schools participating	1	1	3	2	2	1
Median number of postsecondary schools participating	1	1	1	1	1	1
Percentage of regular districts saying tech-prep program:						
Includes provisions for special populations	67	60	62	82	NA	62
Provides teacher in-service	92	78	88	94	NA	82
Provides counselor training	83	67	79	74	NA	68
Involves business and industry in program development	58	68	71	71	NA	64
Has formal enrollment	33	35	21	47	NA	41
If program has formal enrollment, median number of grade 11–12 students enrolled	18	27	26	25	18	24

Source: Omnibus District Survey, Version B

Table 13.9
Tech-Prep Programs in Vocational Districts, 1991–92 by Program Area

	Agriculture	Business/ Office	Marketing	Occupational Home Economics	Health	Trade & Industrial
Median year of actual or planned implementation	1992	1992	1992	1992	1992	1991
Median number of secondary schools participating	7	3	4	6	4	3
Median number of postsecondary schools participating	1	1	1	1	1	1
Percentage of regular districts saying tech-prep program:						
Includes provisions for special populations	61	58	53	59	61	67
Provides teacher in-service	74	72	72	76	75	77
Provides counselor training	61	58	56	56	56	66
Involves business and industry in program development	74	79	78	79	80	84
Has formal enrollment	43	47	34	41	49	49
If program has formal enrollment, median number of grade 11–12 students enrolled	*	16	*	*	40	24

* Insufficient information to estimate

Source: Omnibus Survey of Vocational Districts

However, we need to look more closely at the data to put these findings in perspective. For one thing, most of the programs are brand new (see Tables 13.8 and 13.9). The median year in which they were started was 1992; that is, half of the subject-specific tech-prep programs were reported to be starting in the same year that the survey was administered — in fact, in the same six-month period.

Our case studies testify to the recency of most tech-prep initiatives. For example, researchers in different sites typically reported:

> "Tech prep is in its infancy in [this community]."
>
> "There is an unsigned draft of an articulation agreement [for one computer course] ... This appears to be the only formal progress to date."
>
> "Tech prep is just a concept here; it appears to be widely supported but not well understood."
>
> "Tech prep [is] in the informational stage."

Because they are new, the tech-prep initiatives tend to be small, and most have no students yet. Only 38 percent of the subject-specific tech-prep programs reported by regular school districts have formal enrollments (Tables 13.8 and 13.9).[8] Of the 38 percent, less than half (45%) actually provided numbers of students enrolled. Thus, we have tech-prep student enrollments from only 17 percent (38% times 45%) of the districts that say they have tech-prep programs in specific vocational fields; they, in turn, are only a subset of all districts. Vocational districts with tech prep are a little more likely to have formal enrollments and to provide student numbers, but the differences are not pronounced, and the great majority of vocational programs are in regular districts. In the small group of regular districts reporting any tech-prep students, the median number of students enrolled ranges from 18 to 27, depending on the occupational field. In vocational districts, the medians range from 16 to 40.

The data on student participation from postsecondary institutions are equally striking. Although two-thirds of all postsecondary institutions (three-fourths of all community colleges) said they had tech-prep programs, 72 percent of those with tech prep reported that there are **no secondary students** in their programs, and 87 percent reported that there are **no postsecondary students**.

Multiplying (a) the proportion of postsecondary schools that reported tech-prep programs with (b) the proportion of programs that reported any students, we find that only 19 percent of these postsecondary institutions participate in tech-prep consortia that have any secondary students, and only 9 percent in consortia that have any postsecondary students.[9] (Note that at the secondary level, the derived proportion of programs reporting any students is about the same: 17%.) The newness of the tech-prep programs probably helps account for the difference between the proportions of secondary and postsecondary institutions that report any tech-prep students.

Our informal site visits suggest that even in those programs that have students, the extent and nature of student participation may be problematic. Some students may simply be taking tech-prep courses to get advanced placement credits, while others may be committed to the full program. Since tech-prep courses are usually regular vocational or academic courses that fit in a tech-prep sequence, they enroll regular as well as tech-prep students. In the absence of formal enrollments, all that distinguishes a regular student from a tech-prep student may be his or her intention to continue with the program at a particular postsecondary institution. Needless to say, those intentions can change often. Along these lines, one case study of an urban community in the Southwest found that

> it is not known whether a student is a 'tech prep' student until he has reached the end of the first [semester] in [the postsecondary institution]. Thus the secondary district has no knowledge of how many 'tech prep' students there are.

Another question related to student participation is how many secondary tech-prep participants actually make the transition to postsecondary institutions, and how many attain associate degrees. If the proportions are small, the programs will not be achieving much of their central purpose.

One advocate of tech-prep estimates that half of the tech-prep students in high school will go on to postsecondary education.[10] Preliminary data from the 1993 Omnibus Follow-up Survey are consistent with this estimate. Based on percentage estimates by vocational administrators in the small number of districts reporting on program retention (9–11% of tech-prep districts), a median 77 percent of their tech-prep students complete the secondary phase of the program, and 47 percent go on to the postsecondary phase. Of those who make the transition, postsecondary administrators estimate that a median 59 percent finally complete the program.

We emphasize that these are only administrators' estimates of retention/completion rates, and that most administrators did not provide any data on these items (83% of the secondary respondents said that it was "too early to tell"). It would be better to have actual counts of students, but such information is not available. Unless these estimates are greatly exaggerated, however, it seems that in a small number of established tech-prep programs, the transition and completion rates are quite respectable.

At the same time, the finding that half or more of secondary tech-prep students do not go on to postsecondary education has led some advocates to include work immediately after high school as a normal component of the tech-prep model.[11] For students who complete the secondary part of a tech-prep program but do not go on to a postsecondary institution, the meaning of tech-prep changes substantially: It becomes something like a coherent sequence of integrated courses in an occupational "major," perhaps one that offers higher-level education than is typically found in secondary vocational programs. An informal poll of state vocational administrators in a focus group on tech prep found that 4 of 10 states considered either work after high school or an associate's degree acceptable goals of tech prep; 6 of 10 considered only an associate's degree an acceptable outcome.[12]

Our survey and case study findings on the implementation of tech prep parallel those in a study conducted for the Assessment by the National Center for Research on Vocational Education. In that study, Hayward and others examined tech prep by surveying state offices, visiting eight sites in four regions, and reviewing the literature on tech prep.[13] They reported that their data suggest "the infancy of tech-prep throughout the country."

To assess programs, the authors identified five essential components of tech prep and determined the extent to which those elements were found in the sites visited. The components were (a) integration, (b) articulation, (c) a link between school and work, (d) core curriculum and course sequencing, and (e) emphasis on learner outcomes. Their conclusions regarding the implementation of tech-prep programs were as follows:

> We found that the bulk of tech prep programs had adopted the strategy of least resistance, i.e., for the most part, only the simplest form of reform.

More specifically, to paraphrase the report,

> 1. Most of the programs were still viewing articulation on a course-by-course basis.
>
> 2. Most were still emphasizing advanced credit for postsecondary institutions and were not emphasizing the development of **advanced skills** in secondary courses.
>
> 3. Most "had adopted only the most rudimentary integration." While some had purchased applied academics materials, few had integrated courses across curricula.
>
> 4. Most were just beginning to develop partnership agreements with business and industry.

> 5. The development of core curricula was just starting. "No programs had adopted a fully developed core curriculum intended for all students, as envisioned by Parnell." 14

Despite the rudimentary nature of most tech-prep efforts, the authors note that:

> The few programs that have operated for at least five years have advanced their scope and objectives beyond the articulation of existing courses that merely provide advanced placement credit...[and] have incorporated completely new courses, course sequences in an entire program area, and the development of academic and vocational-technical core curricula...[15]

In sum, the great majority of tech-prep programs are in either the planning stage or the early stages of implementation. Many districts and postsecondary institutions are taking steps to develop tech-prep programs, but, as with integration, the efforts are not as deep as they are broad.

Both survey and case study data indicate that the number of functioning programs and the number of students in those programs are small. Nevertheless, there is some evidence that mature tech-prep programs are providing students with a good secondary education and facilitating the transition to postsecondary institutions.

We do not know how many of the fledgling tech-prep initiatives will survive, and how many will develop into mature programs. The first does not imply the second, because a new tech-prep initiative could continue as a simple advanced placement program for a long time, without becoming a fully developed tech-prep program. The maturation of tech-prep initiatives and the nature and extent of student participation, student retention, and student outcomes are subjects that will require close scrutiny in the future.

The Role of Perkins in Local Tech-Prep Efforts

We would expect school districts and postsecondary institutions receiving Perkins Title III Tech-Prep Grants to have more fully developed tech-prep initiatives than those not receiving grants. Indeed, the survey data show that among the school districts developing tech prep, those receiving Title III funds are more likely to have taken specific implementing steps than those without funds (Table 13.10). This is true of every category of activity in both regular and vocational districts.

Table 13.10
Secondary Districts' Steps Toward Tech Prep By Perkins Title III Funding Status

	Regular		Vocational	
	Funded	Unfunded	Funded	Unfunded
Hold tech-prep meetings with local secondary institution(s)	100	90	100	96
Form consortium with other local educational agencies for tech-prep purposes	92	79	90	83
Provide teacher or counselor training on tech prep	87	78	86	68
Modify curricula for tech prep	81	73	95	76
Develop course sequence(s) for tech prep	79	68	90	75
Develop activities or programs to prepare students for tech-prep option	88	68	88	70
Tech-prep policy adopted by governing board	73	65	88	63
Establish formal tech-prep enrollment procedures	87	80	69	50
Employ a tech-prep coordinator	49	35	77	35
Develop "all aspects of the industry" curriculum for use in tech-prep program	44	33	69	43

Source: Omnibus District Surveys, Version B and Vocational

The evidence suggests that Perkins tech-prep funds may have more impact in vocational districts than in regular districts. In seven of the ten implementing steps listed, the difference between funded and unfunded vocational districts is greater than the difference between funded and unfunded regular districts.

For example, vocational districts with tech-prep funding are 2.2 times as likely as unfunded districts to hire tech-prep coordinators; regular districts with tech-prep funding are only 1.4 times as likely as those without funding to do so. Similarly, vocational districts with tech-prep funds are 1.6 times as likely as those without them to include "all aspects of the industry" instruction in their tech-prep programs; regular districts with funding are only 1.3 times as likely to do so. One interpretation of these data is that the payoff for federal tech-prep investment is bigger in vocational districts than in regular districts, although factors other than school type could explain the observed differences.

At the postsecondary level, Title III fund recipients are more likely than other institutions to take certain steps to develop tech-prep programs, but the tendency is not as pronounced as at the secondary level (Table 13.11). Funded community colleges are more likely than unfunded ones to hire tech-prep coordinators, sponsor joint training of secondary and postsecondary instructors, and have formal tech-prep policies from their governing boards. In other areas, funded community colleges are rather similar to unfunded colleges.

In postsecondary vocational institutions the relation between funding and the probability of taking steps to implement tech prep is stronger. As with community colleges, funded vocational institutions are more likely than others to hire tech-prep coordinators, sponsor joint training of teachers, and have formal tech-prep policies. However, they are also more likely to establish sequences of courses, report collaboration between secondary and postsecondary instructors, and grant postsecondary credit for high school courses.

In community colleges, then, steps to develop tech prep often occur without the incentive of Title III funding. Funding seems to enhance the ability of community colleges to take certain steps that have specific costs associated with them, such as hiring tech-prep coordinators and providing in-service training. Title III funding of vocational institutions is associated more consistently with tech-prep implementation steps than the funding of community colleges.

However, we need to be cautious in interpreting the relation between Title III funding and increased program implementation as evidence of a Perkins effect on tech prep. Districts and postsecondary institutions that have **already started** tech-prep initiatives are more likely to receive Title III funds than those that have not (Table 13.12).

Some 26–28 percent of districts (regular, vocational) that had tech-prep initiatives **before** 1991–92 got Perkins tech-prep funds, compared to only 5–6 percent of the districts that had **no** initiatives before 1991–92. Similarly, 47 percent of postsecondary institutions that already had tech-prep initiatives got Title III grants, as compared to 29 percent of those that had no previous tech-prep efforts. From this perspective, more implementation of tech prep might be "causing" Perkins Title III funding to occur, rather than the other way around.

Table 13.11
Steps to Implement Tech Prep in Postsecondary Institutions By Perkins Title III Funding Status (Percent)

	Community Colleges		Vocational Institutions	
	Funded	Unfunded	Funded	Unfunded
Hold tech-prep meetings with local school districts and/or schools	98	97	100	95
Develop articulation agreement(s) with local school districts and/or schools	96	95	93	85
Collaboration between secondary and postsecondary instructors to modify course content	85	84	91	79
Grant postsecondary credit for high school courses	78	79	78	69
Establish secondary/postsecondary majors or career paths	77	76	81	79
Tech-prep policy adopted by governing board	78	67	83	71
Establish non-duplicative sequence of secondary and postsecondary tech-prep courses	75	69	87	68
Provide written publicity about tech-prep program(s) to high school students	71	62	80	61
Joint training of secondary and postsecondary instructors	74	52	85	56
Modify postsecondary curricula for tech prep	62	58	60	46
Employ a tech-prep coordinator	75	44	85	42
Develop "all aspects of the industry" curriculum for use in tech-prep program	43	39	57	51

Source: Omnibus Survey of Postsecondary Institutions

Table 13.12
Districts and Postsecondary Institutions Receiving Title III Tech-Prep Funds, By Presence or Absence of Tech-Prep Initiatives Before 1991–92 (Percent)

	Had Tech-Prep Initiative Before 1991–92	Did Not Have Tech-Prep Initiative Before 1991–92
Regular districts	26	5
Vocational districts	28	6
Postsecondary institutions	47	29

Source: Omnibus Surveys of Regular Districts (Version B), Vocational Districts, and Postsecondary Institutions

There is probably a straightforward reason for this pattern of allocation. As we have seen, most Title III grants are awarded on a competitive basis, and districts that have already started tech-prep programs may be more likely to apply for grants than those that have not. Because they are more familiar with tech prep, administrators in these districts may also write better grant applications. In any case, the main effect of Tech-Prep Grants seems to be to enable districts with existing tech-prep initiatives to develop those efforts further and/or to develop new initiatives (e.g., programs in other subject areas).

Because Perkins tech-prep money is going primarily to districts that have some experience with tech prep, new tech-prep programs are being initiated more rapidly in districts that did not receive Tech-Prep funds in 1991–92. Among regular districts, the proportion of unfunded districts with tech-prep initiatives increased 110 percent between 1990–91 and 1991–92; the proportion of funded districts with tech prep increased only 33 percent. Among vocational districts the differences were less pronounced but still substantial: The proportion of unfunded districts with tech prep increased 34 percent between 1990–91 and 1991–92, while the proportion of funded districts with tech prep increased only 12 percent. The creation of tech-prep programs in new districts occurs largely without the benefit of Perkins Tech-Prep Grants, although the more general influence of the Perkins Act probably plays a role.

These findings suggest that Perkins Title III Grants are more likely to help existing tech-prep initiatives expand than to stimulate the creation of new ones. However, the analysis in Chapter 10 of Perkins influence on tech prep, observations from the case studies, and the marked increases in steps taken to develop tech prep between 1990–91 and 1991–92 also suggest that the Perkins Act has had a role in increasing the overall level of tech-prep activity.

Is Tech Prep High-Tech?

The term "tech prep" connotes education in highly technical fields, such as electronics and computer systems, and Parnell's model emphasizes preparation for technical work. Title III of the Perkins Act also calls for technical education but defines eligible program areas broadly: Tech prep should provide "technical preparation in at least one field of engineering technology, applied science, mechanical, industrial, or practical art or trade, or agriculture, health or business."[16] In effect, all the major vocational program areas are included. What subjects are most often found in tech-prep programs, and what subjects are least often included? How does the distribution of tech-prep subjects compare to that of vocational education in general?

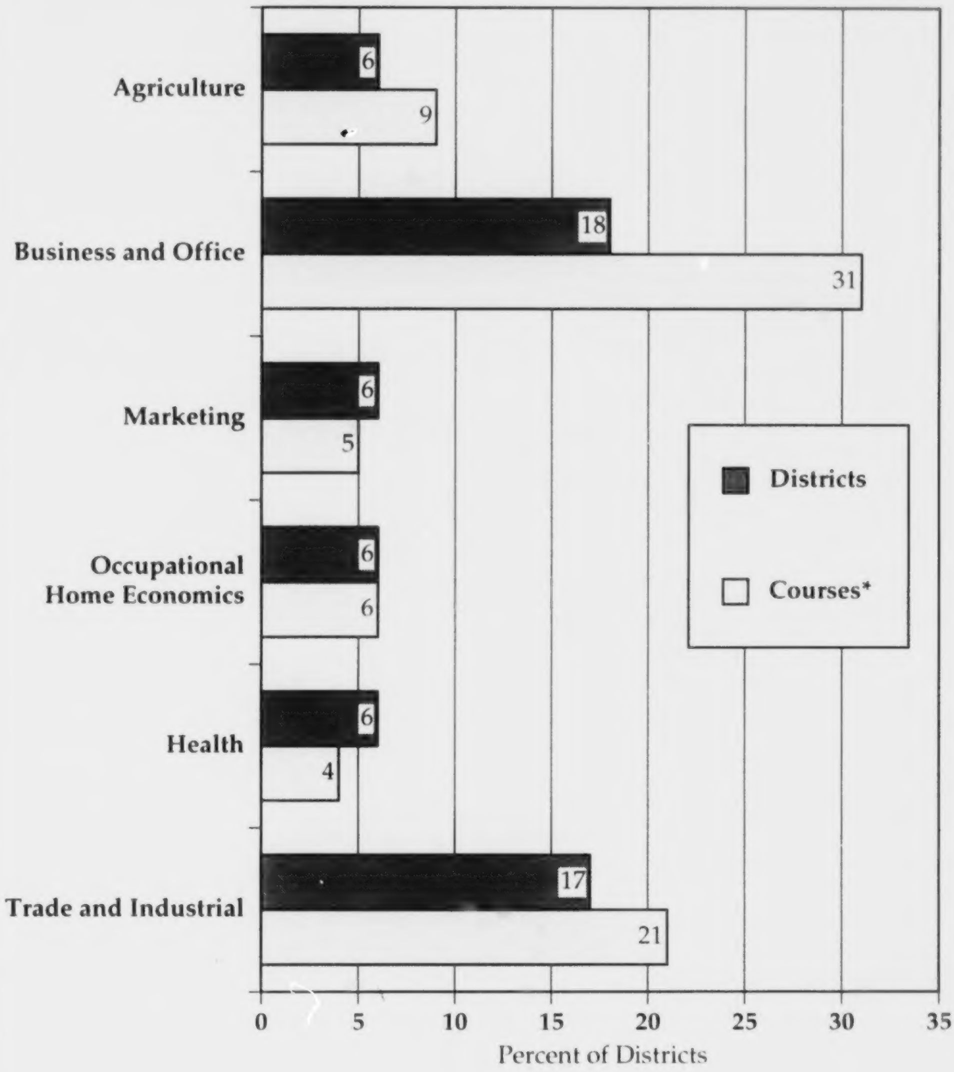
In secondary districts, the occupational programs most likely to have tech prep are business and office education and trade and industrial education (Figure 13.1). Some 18 percent of districts report tech-prep programs in business and office education and 17 percent report tech prep in trade and industry programs. In the other four occupational areas listed, a uniform 6 percent of districts report tech-prep programs. With some exceptions, the distribution of tech-prep programs across subject areas at the secondary level tends to reflect the distribution of secondary vocational courses, consistent with the Perkins Act. The principal exception is business and office education which has relatively few tech-prep programs compared to its large number of courses.

Postsecondary tech-prep initiatives are also more likely to be found in some occupational areas than in others (Figure 13.2). Around three-fourths of the community colleges with tech prep report programs in business/management and office support, and 60 to 70 percent have initiatives in health; computers/data processing; communications, engineering, and science technologies; and trade and industry.

Postsecondary **vocational** institutions show similar patterns, but there are some differences. Vocational institutions are less likely than community colleges to have initiatives in business/office and marketing programs. In both kinds of postsecondary institutions, tech-prep efforts are less likely to be found in agriculture, marketing and distribution, occupational home economics, and protective services than in other occupational areas.

As at the secondary level, the distribution of tech-prep initiatives across different vocational fields in postsecondary institutions resembles the distribution of postsecondary occupational courses in general, with the possible exception of

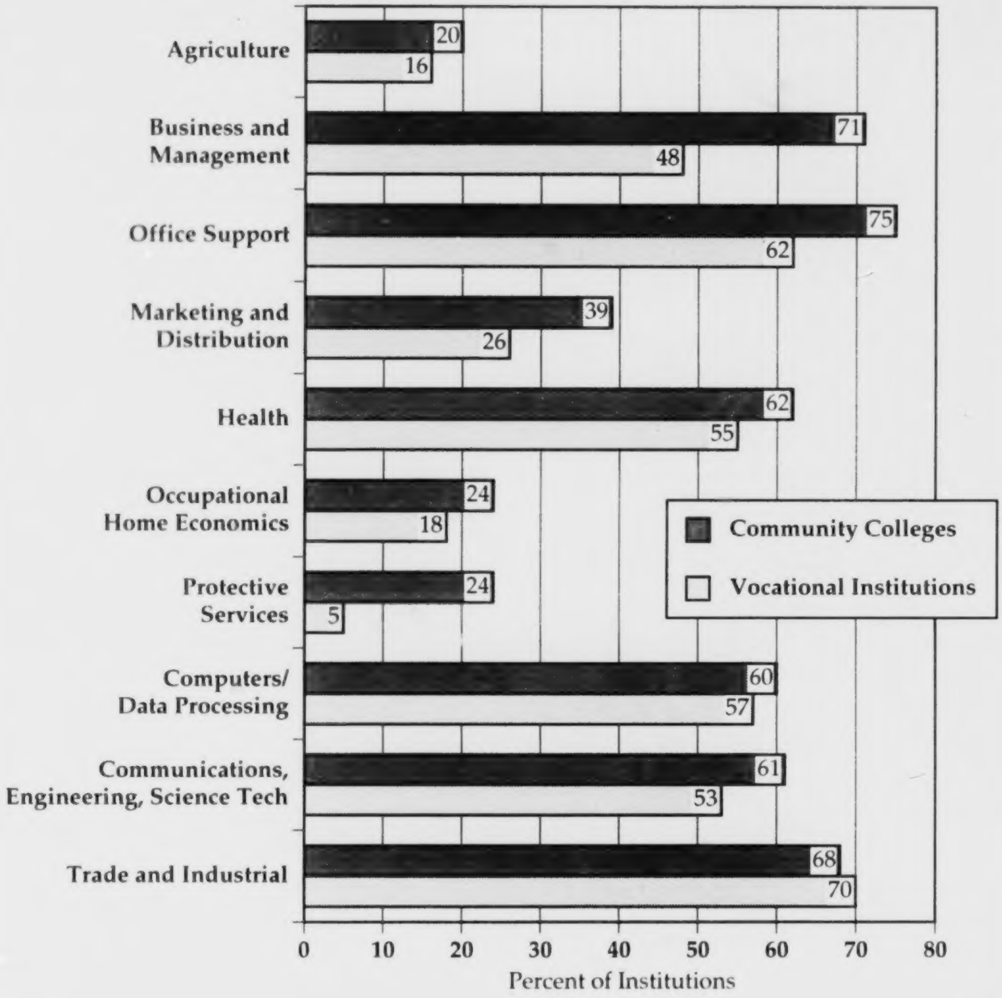
Figure 13.1
Percentage of Secondary Districts With Tech Prep Reporting Programs in Specific Areas, and Percentage of All Vocational Courses in a Program Area



* Does not include percentages for technical/communications education, technology education/industrial arts, and "other" vocational courses.

Source: Omnibus District Surveys, Version B and Vocational; National Assessment of Vocational Education Teacher Survey

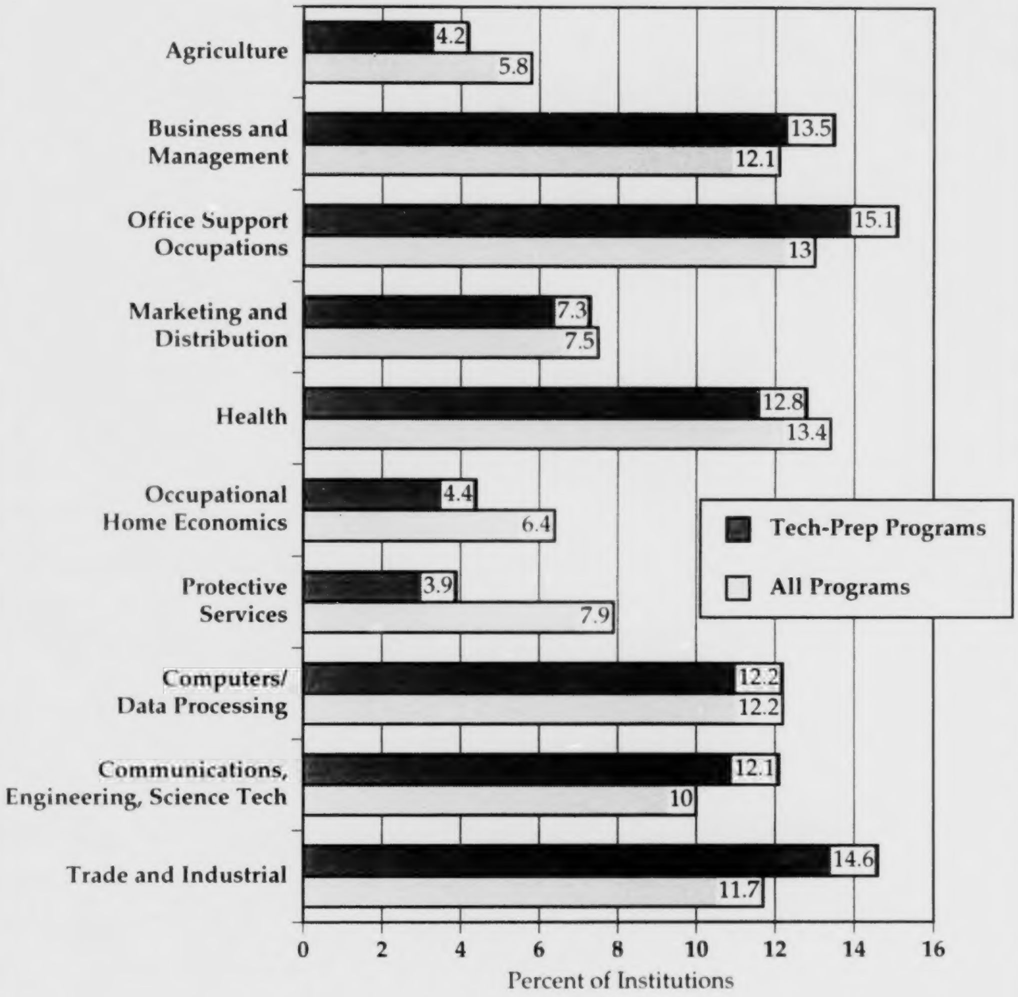
Figure 13.2
Tech-Prep Program Areas In Two-Year Postsecondary Institutions



Source: Omnibus Survey of Postsecondary Institutions

protective services (Figure 13.3). In short, if vocational progam areas reflect different degrees of technical emphasis, there seems to be no particular concentration of high-tech subjects in tech prep. At both the secondary and postsecondary levels, tech-prep programs are broadly distributed across the occupational curricula. It may be that tech-prep programs have a high-tech emphasis **within** vocational program areas, but we have no data with which to explore that possibility.

Figure 13.3
Distribution of Tech-Prep Programs and All Vocational Programs in Postsecondary Education



Source: Omnibus Survey of Postsecondary Institutions

Do Tech-Prep Programs Provide Equal Access?

The Perkins Act requires basic grant recipients to provide special population students with equal access to "good quality" vocational education programs, and tech-prep programs are usually regarded as being of high quality. Perkins also explicitly requires that districts receiving Title III tech-prep grants provide special populations with equal access to tech-prep programs.[17]

One way to determine the degree of access is to use the "equal educational opportunity" model, in which there are no external barriers to opportunity based on characteristics such as age, sex, race, or disability status. One limitation of the equal opportunity model, however, is that it does not take into account the educational deficits of individuals in some groups that may limit their ability to take advantage of opportunities. This consideration has given rise to the "compensatory education" model, which makes special provisions for members of those groups, to enable them better to avail themselves of opportunities. We will assess equal access to tech prep for special populations by reference to both models.

Using the equal opportunity approach, we can examine the prevalence of tech-prep initiatives across districts with different proportions of special populations. If the districts have about the same prevalence of tech-prep programs, then the programs are distributed across districts without regard to the special population status of students.

The survey data across all districts show that the occurrence of tech-prep initiatives is unrelated to proportions of special population students (Table 13.13). Districts with high proportions of special populations are as likely to be developing tech prep as those with low proportions.

In the subset of districts with Title III Tech-Prep grants, however, the picture is a little different (Table 13.13). Districts with low proportions of special populations are about as likely to receive grants as districts with high proportions. However, districts with the next-to-highest proportions (third quartile) of special populations are less likely than districts with low proportions to receive Perkins Tech-Prep Grants. This outcome is no doubt the byproduct of tech-prep funding decisions made on other grounds, but it does fall short of equal access in this model.

Using the compensatory education model, the Omnibus Survey asked administrators in districts with tech prep if their programs included provisions for special population students. In both regular and vocational districts, about two-thirds of the programs have such provisions but one-third do not (see Tables 13.8 and 13.9).

In Title III-funded districts, where Perkins explicitly requires equal access to tech prep for special populations, the proportion of tech-prep programs including provisions for special populations is higher, ranging from 73 percent to 86 percent in regular districts and from 68 percent to 91 percent in vocational districts, depending on vocational program area. (See Table 13.14.) Some of these programs are still in the planning stage, and there are other ways to assure equal

Table 13.13
Regular and Vocational Districts With Tech-Prep Programs and Title III Tech-Prep Programs, 1991–92 By Proportion of Special Population Students in District (Percent)

	Regular		Vocational	
Proportion of Special Populations	No Tech Prep	Tech Prep	No Tech Prep	Tech Prep
All Districts				
Lowest quartile	56	44	17	83
Second quartile	61	39	21	79
Third quartile	59	41	16	84
Highest quartile	59	41	20	80
Title III Tech Prep Districts				
Lowest quartile	89	11	77	23
Second quartile	89	11	83	17
Third quartile	93	7	87	13
Highest quartile	91	9	76	24

Source: Omnibus District Surveys, Version B and Vocational

Table 13.14
Districts With Title III Tech-Prep Programs That Have Provisions for Special Students (Percent)

	Regular Districts	Vocational Districts
Agriculture	80	91
Business/office	74	72
Marketing	68	81
Occupational home economics	73	80
Health	84	72
Trade and industry	86	68

Source: Omnibus District Surveys, Version B and Vocational

access for special populations. Therefore, Title III Grant recipients seem to be close to compliance on this issue.

However, in the case study sites, most of which are Title III recipients, special population students tend to be a secondary consideration in developing tech prep. The case study summary observes that while special population students are sometimes targeted for tech prep, "most other districts are targeting their tech-prep courses to students who are neither members of special populations... nor top college-bound students." [18] This focus on students in the middle half is, of course, part of the initial design of tech prep. The districts in these studies tend to see tech prep as a way to attract better students to vocational education.

On the whole, the data suggest that more attention should be paid to developing educational strategies that will help prepare special population students to benefit from tech-prep programs.

CONCLUSION

As with integration, tech-prep implementation at present tends to be widespread but shallow. There are hundreds of new, small tech-prep initiatives in high schools and postsecondary institutions across the country, along with a few more mature programs. Most programs are in the planning stage or in the earliest stages of implementation, and most have no students yet. Many institutions have articulation agreements, but usually at the course level, not the program level. Many tech-prep initiatives have some integration, but it tends to be rudimentary. Some programs consist of little more than a few articulated courses.

Student participation is often ill-defined and student outcomes are uncertain. In particular, attention should be paid to the rates of transition between secondary and postsecondary institutions and to postsecondary completion rates. Preliminary estimates of these rates in the small number of mature tech-prep programs are promising, but many questions remain about future rates across all programs.

High schools and postsecondary institutions seem to be trying to fit small tech programs or pieces of programs into their existing curricula. So far, we do not see tech prep generating the systemic reform implicit in the Perkins Act. However, the process of developing and implementing tech-prep programs is long and arduous. Articulation is time-consuming and fraught with scheduling and personnel problems, turf battles, limited resources, and a range of other difficulties. Sometimes postsecondary institutions have to develop articulation agreements, course by course, with several different high schools, each with different curricular offerings, schedules, organizational characteristics, and staff personalities.

The key question is, to what extent are the present tech-prep initiatives merely local adaptations that will permit business to continue as usual, and to what extent do they represent the beginnings of broader, more systemic reform? Hayward and his associates observe that:

> All in all, one might be inclined to look at [the] results with disappointment. However, in our view, that would be an ill-advised conclusion. These results are precisely what one would expect from a very new, very complex education reform.[19]

Hayward notes that the few programs that have operated for at least five years seem to be doing well. But we must ask, how many of the new tech-prep initiatives will survive for at least five years? How many have the potential — in terms of mandate, commitment, resources, and structural elements — to endure and to grow? To what extent will course articulation turn into program articulation? To what extent will these new, relatively minor adjustments to the curricular structure evolve into systemic reform?

One encouraging sign is that some states are mandating tech prep by legislation or policy. New York and South Carolina are calling for tech-prep programs that resemble the Perkins model. Wisconsin is requiring districts to develop tech-prep programs in which the key element is academic/vocational integration. Other states, such as Indiana and Maryland, also have official tech-prep policies.

Despite a rough start and uncertain future, tech-prep programs should be given a chance to grow, and federal support for them should be continued. At the same time, the government should monitor and evaluate these programs, with particular attention to longitudinal studies of student participation (including that of special populations), retention, and educational and employment outcomes.

ENDNOTES

1 National Commission on Excellence in Education (1983). *A Nation at Risk: The Imperative for Education Reform*. Washington, DC: U.S. Department of Education.

2 Parnell, D. (1985): *The Neglected Majority*. Washington, DC: Community College Press.

3 Ibid., pp. 143-44.

4 Sec. 347 (3).

5 A note on methodology: State secondary and postsecondary agencies were asked to identify themselves as solely responsible for tech prep in their states, jointly responsible, or not responsible. The purpose was to produce one respondent to tech-prep questions for each state. If a state agency identified itself as solely responsible for tech prep, and was the only one doing so, its responses were used. If secondary and postsecondary agencies said they were jointly responsible, preference was given to the latter, because postsecondary institutions in the past have typically been the initiators of tech-prep programs. In some instances both secondary and postsecondary agencies in a state claimed sole responsibility for tech-prep programs. The reasons for these apparently conflicting claims are unclear, but in these cases only the postsecondary responses were used for analysis. However, differences between the two types of agencies were small, and either or both could have been used without changing the results substantially. The data here reflect the responses of 48 regular states (not territories) and the District of Columbia.

6 The mean dollar amounts are $958,821 for an average state and $73,755 for an average grant to a consortium.

7 These proportions are much higher than those reported by the General Accounting Office (*Vocational Education: Status in School Year 1990–91 and Early Signs of Change at the Secondary Level* (GAO/HRD-93-71), July 1993, p. 24. and *Vocational Education: Status in 2-year Colleges in 1990–91 and Early Signs of Change*. (GAO/HRD-93-89), August 1993, p. 24.) GAO found that 36% of two-year colleges with vocational programs had tech-prep in 1991–92 and 18% of public secondary schools had tech prep a year earlier, in 1990–91. GAO did not define tech prep in its survey, while the Omnibus Surveys defined it broadly and then asked a series of clarifying questions about the programs' characteristics. As later discussion in this section shows, examination reveals that the number of **functioning** tech-prep programs is relatively small, as GAO also found.

8 The mean percentages here are weighted averages of the figures in the tables.

9 If we use the following multiple criteria for a functioning tech-prep program — that districts have modified their curricula, developed tech-prep course sequences, and trained teachers or counselors for tech prep — we find that 22% of all districts have functioning tech-prep programs (53% of the 42% of districts reporting tech prep).

10 Hull, D, (1993). *Every Student Wins: Delivering Education that Works* pp. 17–18. Waco, TX: Center for Occupational Research and Development.

11 Ibid.

12 National Assessment of Vocational Education Focus Group on Tech Prep, meeting of the National Association of State Directors of Vocational and Technical Education, Kansas City, MO, September 15, 1992.

13 The information in this discussion comes from Hayward, G.C., et al. (1993). *A Literature Review for Tech Prep.* Draft report prepared for the National Assessment of Vocational Education. Berkeley, CA: National Center for Research in Vocational Education.

14 Hayward, et al., pp. 43–44.

15 Ibid., p. 15.

16 Sec. 347 (3) (B).

17 Sec. 240 (1) (B) (4); Sec. 344 (b) (6).

18 Milne, A., Martindale, M., & Michie, J. (1993). *Vocational Education in Communities.* Draft report prepared for the National Assessment of Vocational Education. Rockville, MD: Westat.

19 Hayward et al., p. 44.

CHAPTER 14

WORK EXPERIENCE PROGRAMS

INTRODUCTION

Nearly half of America's youth leave high school with the expectation of entering the labor market, rather than continuing their education. However, the United States has few institutional linkages to assist non-college-bound youth with the transition from school to work. The high rate of unemployment among non-college-bound youth, coupled with the growing concern that the skills of our workforce must be upgraded to compete in an ever more technologically advanced global economy, have sparked a new interest in work experience programs.

Employment Status of Non-College-Bound Youth

Data on labor force participation of non-college-bound youth show a pattern of moving from one short-term, low-wage, "dead-end" job to another, interspersed with periods of unemployment. By age 30, almost one-third of men are working in jobs they have held for under a year. Another 16 percent have been employed for just one year. The pattern is similar for women who have been in the labor market for the same amount of time.[1]

The General Accounting Office[2] reports that U.S. schools direct students toward college, where education and training resources are concentrated. However, those who never enter college cannot benefit from this public investment. At the same time, employers who offer good wages, attractive benefits, and internal career ladders have first pick in the labor market; and they rarely choose high school graduates. Firms best equipped to provide high-quality training to their employees invariably choose older, more mature workers for their entry-level career opportunities.[3]

In contrast to the American system, Japanese firms have semi-formal, long-term agreements with high schools. As a result, Japanese schools play a far more active role in introducing students into the labor force. In Japan, the best firms hire the highest achieving students from the best high schools. This provides an economic incentive for students to excel at the high school level. While American young people move from one short-term, low-expectation job to another and receive little orientation to available careers or necessary training, their counterparts in some other countries gain pride, master increasingly difficult skills, and acquire experience working in the adult world.[4]

Some researchers argue that the instability in the early years of labor force participation is not a problem in itself.[5] Rather, they see this period as one wherein young people experiment with a variety of occupations. They note that American youth can and do exercise far more choice than their European or Japanese counterparts.

Even those who see this period as one of freedom and choice realize, however, that for certain subgroups, particularly minority youth, the lack of structure in the transition from school to work has great and lasting costs. According to 1990 data, only 29 percent of black high school dropouts between the ages of 16 and 24 are working at any job, compared with 57 percent of whites. Likewise, only a little more than half of all black youth with high school diplomas are employed—55 percent compared with 79 percent of whites.[6]

The Rising Demand for Higher Skill Levels

The issue of increasing demand for higher skills continues to attract a lot of attention in the popular press. Critics argue that many American workers do not possess the skills necessary to succeed in the labor market. This is thought to be especially true for those young people who do not go into postsecondary education. For youth, it is often said that their reading, writing, math, and communications skills are generally inadequate for the demands of today's quality employers. The National Assessment is examining changing skill requirements in the labor market and will include the results of that inquiry in the Final Report.

New forms of work organization are emerging in American business and industry in response to the pressure of international economic competition. Sometimes referred to as the "high-performance work place," these innovations usually include the devolution of more decision-making power to front-line workers and an emphasis on activities such as teamwork, job rotation, quality control, and employee problem-solving groups (quality circles).

There is debate over how rapidly the high-performance workplace is emerging. A 1990 study by the Commission on the Skills of the American Workforce, based on surveys of a cross-section of American firms, concluded that "95 percent of American companies still cling to old forms of work organization."[7] On the other hand, a careful survey of American firms conducted by Osterman in 1992 found that in 37 percent of firms, 50 percent or more of core employees were engaged in at least two of four high-performance workplace practices: teamwork, job rotation, quality control, and quality circles.[8]

While the debate continues, and while these findings do not yet signal a transformation of the American workplace, we are inclined to think they do indicate that significant changes are occurring in the structure of the workplace, and that they put a premium on conceptual and technical skills. The Final Report will address these issues more fully.

The Role of Work Experience Programs

As we saw earlier, academic and vocational integration, tech prep, and work experience programs such as cooperative education and new youth apprenticeships are usually regarded as critical to improving the school-to-work transition. Having just examined integration (Chapter 12) and tech prep (Chapter 13) , we turn to a discussion of work experience programs.

Advocates of these programs believe that they show strong potential to help the United States compete in global markets by improving workforce preparation and facilitating the transition to work. Work experience programs have been developed in an effort to improve both the occupational and academic options of young people who will not earn a four-year baccalaureate degree.

Largely on the basis of qualitative data, the General Accounting Office concluded that both students and employers can benefit from participating in high-quality work experience programs. Students attain work experience and job skills, and increase the likelihood of permanent employment. Employers gain access to a prescreened pool of employees. Students participating in work experience programs are more likely to stay in school and pursue additional education, according to co-op coordinators interviewed by GAO.[9] Later, we will examine systematic quantitative studies bearing on these issues.

The remaining sections of this chapter will review the major work experience programs that are available to high school students and students in two-year colleges. Where data are available, results of program evaluations also will be presented.

WORK EXPERIENCE PROGRAMS FOR HIGH SCHOOL STUDENTS

For those still in high school, innovative programs to strengthen the link between school and work tend to fall into two general categories. The first category includes programs that build on classroom teaching by bringing work and career issues into the curriculum. This type of approach includes integrated programs such as career magnet schools and career academies; it also includes tech-prep programs. The previous two chapters have examined these reform strategies. This chapter will focus on the second approach — programs that get young people out of the classroom and into workplace settings, or what are referred to as "work-based strategies." Included in this category are cooperative education (co-op) programs, school-based enterprises, and Youth Apprenticeships. Although not part of any formal program, students working on their own initiative while still in high school are also of interest, and research on this activity will also be examined.

Co-op Programs

According to the Omnibus Survey, approximately 403,000 secondary students participate in co-op programs; that is 8 percent of the students in grades 9–12. This estimate is close to one from the General Accounting Office, which found that approximately 450,000 students, or 4 percent of those in grades 11 and 12, participate in co-op. [10] In fact, co-op is the most commonly available option for work-based learning in the United States, and is offered in about half of all secondary schools. [11]

Co-op education is run by individual schools as part of their vocational education programs, and students are provided part-time jobs during the school year in their field of vocational specialization. The job placements are arranged by the classroom vocational instructor or by the school's co-op coordinator. A training plan that clearly states what the student is expected to learn and what the employer is expected to provide is developed. Business and marketing programs are currently the largest sponsors of co-op education.

Co-op programs are not aimed at any particular segment of the population, and they were not established exclusively to serve poor youth, minorities, or underachievers. The demographic information on program participants shows, however, that while co-ops serve a broad range of students, they do serve a disproportionate share of lower achievers. A survey of state vocational education directors, conducted by the General Accounting Office[12] in 1990, revealed that 76 percent of all co-op students were white and 48 percent were male. They tended to have lower than average test scores and to come from lower socioeconomic levels. The GAO also reported that only 24 percent of seniors participating in co-op programs nationwide were part of a vocational track in which college and general education students also participated.[13] Yet 41 percent of co-op participants came from the upper half of the socioeconomic status distribution, and 30 percent from the upper half of the test score distribution.

The GAO also determined that participant characteristics varied with the perceived quality of the program. "Programs that were viewed as being of higher quality had higher admission standards and participation rates, whereas those programs that carried the negative stereotype of vocational programs had fewer applicants and were therefore less selective." They found that most programs have admission standards that require co-op students to maintain an average GPA (at least 2.0 in most programs), good attendance, and a positive attitude, and to demonstrate a lack of disciplinary problems.[14]

Evaluation Findings. Overall, few hard data exist to permit a rigorous evaluation of co-op programs. The data that are available show a higher level of satisfaction with school among co-op students, as well as an improved attitude toward both school and work, but the data on economic outcomes are mixed.

Some of the empirical evidence suggests that co-op education does contribute to clarification of career goals, self-confidence, awareness of interpersonal relations, and increased motivation. [15] Although general impressions about co-op education are almost always positive, a review of evaluation literature by Stern et al. [16] suggests that while "research does find that co-op students are relatively satisfied with school ... there is not consistent evidence that they learn more, become more productive, or find better jobs."

Stern and his associates argue that methodological problems with the evaluations may mask stronger positive outcomes from program participation. They conclude that even though positive economic outcomes are not shown, there is some indication that co-op students are finding higher quality jobs than high school students find on their own. [17] This group of researchers argues that co-op placements provide students with positions of greater responsibility, better supervision, mentoring, and more opportunities to learn complex skills. [18]

Preliminary results from a new longitudinal study (which does not correct the methodological problems) conducted by the same authors support their earlier conclusion that co-op jobs (or other school-supervised jobs) are of higher quality than jobs that high school or college students find on their own.[19] Using data from one western state, Stevens[20] also found that co-op students who remained with the same employer after leaving school experienced higher earnings than non-co-op students who also remained with the same employers.

One reason offered for the lack of broadly positive economic returns to co-op education may be the absence of any specific certification procedures. Instead of formal credentials, co-op programs rely on a variety of non-standard "soft" vocational credentials such as letters of recommendation from faculty[21]. Supporting this theory, the GAO[22] reported that participation by students (even in high-quality co-op programs) is not recognized widely as evidence of skill mastery. Some of the high school coordinators contacted for the research indicated that student certification of industry-wide skill standards is one way to improve co-op's success.

New Youth Apprenticeships

The newest and most ambitious of the work experience program models are the new youth apprenticeships. [23] These apprenticeships are designed to provide a structured, work-based learning experience for high school students who are "too young and numerous to qualify for the small number of formal, registered apprentice programs that exist in the U.S."[24] This new concept of youth apprenticeship includes preparation for postsecondary education as well as employment.

Though gaining in popularity, apprenticeships are offered by relatively few secondary schools. One estimate places the proportion at less than 5 percent of schools. [25] In the Omnibus Survey, 11 percent of schools reported either tech-prep apprenticeship programs or other new apprenticeship programs. However, the inclusion of the term "tech-prep" in the question may have caused the estimate to be inflated. The survey found approximately 3300 students in these programs.

This apprenticeship model builds on European training systems that provide structured, non-university routes to good careers through paid work and on-the-job training, combined with related classroom instruction. Each program has formal agreements registered with either state or federal apprenticeship agencies. The apprenticeship agencies award a standardized certificate of completion at the end of the program.

Schools and agencies have been experimenting with a variety of apprenticeship models and systems for a number of years. Although no particular approach appears to dominate, there is a growing consensus about the principles that should guide any youth apprenticeship and about the basic design elements that differentiate youth apprenticeships from other models linking school and work.[26] These principles include:

- Active participation of employers.
- Integration of work-based and school-based learning.
- Integration of academic and vocational learning.
- Structured linkages between secondary and post secondary institutions.
- Award of a broadly recognized certification of occupational skill.

Youth apprenticeship programs are most often found in industries with labor shortages in key technician-level occupations, such as hospitals, metalworking, printing, and other manufacturing industries; they tend to develop in communities with a history of creative business practices. Many new programs are moving in the direction of youth apprenticeship as defined by the basic principles mentioned above.[27]

Evaluation Results. In general, apprentice programs are too new to have undergone any systematic evaluation. Several states, including Arkansas, Minnesota, Pennsylvania, and Wisconsin, have launched demonstration programs for apprenticeships. Those programs will undergo evaluation, but few of them have been around long enough for a cohort of students to complete the high school years and then enter the labor market or the postsecondary component of the programs. So far, there are no data available to judge the programs in terms of student outcomes or employer satisfaction. The National

Assessment of Vocational Education is currently compiling some basic statistics on student participation in apprenticeship programs and on the transition from these programs to regular jobs.

School-Based Enterprises

The third and final type of program reviewed here is school-based enterprises. These are school-based activities that produce goods or services for sale or use to people other than the students who produce them. Such enterprises include school restaurants, construction projects, childcare centers, auto repair shops, hair salons, and retail stores. [28] According to the Omnibus Surveys, 23 percent of secondary schools have adopted some form of school-based enterprise.

These programs differ from co-ops and apprenticeships in that they do not place students with employers. Rather, the goal of school-based enterprises is to allow students to apply their classroom knowledge to running real-world businesses. Unlike the other work experience programs reviewed above, school-based enterprises are a viable option in communities where there are too few employers to provide sufficient jobs and training opportunities in the private sector.[29]

Evaluation Results. Many of the more popular school-based enterprises have been described in the literature, but there has not been any rigorous evaluation of the programs. [30] However, the anecdotal evidence regarding the programs is positive and does suggest that "learning academic and vocational skills through running a small business has been an exciting process for hundreds of young people." [31]

Working Independently While in High School

Though the number of school-based programs that provide employment to students is growing, the vast majority of those who work while in school find employment on their own. Studies comparing the economic outcomes of students who work during high school with those of non-workers find that the high school workers have higher wages in the first years after leaving school than do non-workers. [32] Though all of these studies show positive effects for working while in school, none has controlled for selection bias. It may be that students who find employment in high school also have other "unobservable" traits that would lead to favorable economic outcomes. This issue of selection bias leaves the results open to question.

For those who do work, the number of hours they are employed appears to have a positive impact on economic gains. Stern[33] reports that students who work only a moderate number of hours per week perform better in school and are more likely to enroll in postsecondary institutions after graduating than those who do not work. On the other hand, working more than 15–20 hours per week while in school may interfere with educational attainment and, in the long run, limit economic potential.

WORK EXPERIENCE PROGRAMS FOR TWO-YEAR COLLEGE STUDENTS

Two-year colleges provide a variety of options in the delivery of job-related instruction. The range of work experience programs and the variety of linkages with employers and other non-university organizations is quite broad. This section reviews two of the more common programs — cooperative education and youth apprenticeships. School-based enterprises are primarily secondary programs. There are some in postsecondary institutions, but they are rare and there is little information on them.

Co-op Programs

As at the secondary level, postsecondary co-op programs are the most widespread of the work experience programs. The Omnibus Survey found that 69 percent of two-year postsecondary institutions have co-op programs serving some 81,000 students, or about 2 percent of all students. Recent estimates of the number of co-op programs range from Hirshberg's 437 to the Omnibus Survey's 673.[34]

Cooperative Education programs at the community college level follow the same form as high school programs. They award college credits as well as grades for both worksite learning and related instruction.

Evaluation Results. The majority of evaluations of postsecondary co-op programs have examined programs in four-year institutions. Stern et al.[35] find that, as with high school programs, "evaluations of co-op programs in two-year colleges have been too sparse and too limited to permit any firm conclusions or generalizations."

Again, the anecdotal evidence from a variety of small studies on postsecondary co-op programs appears to be positive. Researchers have found that compared to non-co-op students at the same college, co-op students are more interested in their jobs, see a connection between their job and future (career) jobs, report more opportunities for learning at their jobs, and see the connection between school and work. [36] The effect of these connections on subsequent labor market outcomes is still unknown.

Apprenticeship Programs

Two year colleges are expected to play a major role in the new youth apprenticeship initiative, especially through the tech prep programs. The American Association of Community and Junior Colleges estimates that 35 percent of two-year colleges provide the academic or general education portion of apprenticeship programs. [37] However, only about 16 percent of the postsecondary institutions in the Omnibus survey said they had apprenticeship programs, with an estimated 51,000 students.

As was the case in high schools, apprenticeship programs in two-year colleges combine work-based experience with classroom instruction. A sponsor provides the job-specific training at the work site and the college provides the general training related to the craft or trade. Apprentices usually work on alternative cycles — several months on the job, several months in the classroom.

The majority of partnerships between two-year colleges and industry exist in the established trades (such as shipfitting, machining, pipefitting, and sheet metal working). Currently, the automotive industry is at the forefront of using two-year colleges for the educational needs of the industry. Such partnerships have been most successful when the unions have been involved in a three-way association.

For college students the main benefits of completing an apprenticeship program include (a) certification leading to journey person status from the sponsoring agency and the state, (b) an associate's degree in some field of applied science, and (c) a strong likelihood of employment.[38]

Employers also seem to benefit from the programs, for apprenticeships increase the supply of workers with improved communications skills and up-to-date technical skills. In addition, apprentice programs serve to retrain displaced workers at a lower cost to the employer than if the training program were undertaken entirely by the company. [39]

Evaluation Results. As is the case for college-level co-op programs, there are no studies available that evaluate the economic results of participating in an apprenticeship program. The anecdotal evidence is positive, but sparse, and does not allow for generalizations to this category of programs as a whole.

OBSTACLES TO IMPLEMENTING NEW WORK PROGRAMS

A consensus is developing in the literature that points to credentialling as the principal barrier to the successful expansion of structured work experience training in America[40]. In the United States, as well as in other countries, the successful completion of an apprenticeship program can signal a given level of skill. Without nationally recognized apprentice credentials, however, it is difficult for workers to move through the national labor market, since employers lack a clear idea of the workers' skill levels and capabilities.

Although the value of certifying a graduate's skills is intuitively acknowledged, consensus breaks down over the specific content of assessment that would lead to certification. The certification problems of youth apprentice programs are particularly difficult, since apprenticeship is designed to provide a broad educational foundation through experience and instruction in a specific occupational or industrial area. All apprenticeship advocates agree that graduates should be qualified not only to go directly into the labor market but also to pursue higher education, if desired.[41]

A second obstacle to increasing participation in work-experience programs is the cost to schools and employers. The coordination and integration function played by the co-op coordinator adds to the program costs at the school end. Likewise, many employers are reluctant to hire and train young people. [42] The possibility that trainees will take their newly acquired skills to other employers is often a source of concern.

Finally, high school work experience programs are often constrained by a lack of awareness about them, as well as by negative perceptions of their quality. Many high school programs, in fact, are perceived as low-quality alternatives for underachievers. In contrast to high school programs, co-op programs in community colleges seem to have good reputations. Because co-op was seen as potentially beneficial in finding employment, coordinators at most of the postsecondary programs GAO visited reported a growing interest and enrollment in co-op whenever students began experiencing greater difficulty in finding employment.[43]

CONCLUSION

The past decade has seen a renewed interest, at both high school and postsecondary levels, in work experience programs as a means to ease the transition from school to work for youth who will not pursue four-year baccalaureate degrees.

For high school students, a variety of work experience programs, including co-op, new youth apprenticeships, and school-based enterprises, are available. These programs give students the opportunity to use skills acquired in the classroom in a workplace setting. Though evaluation data for these programs are largely unavailable, anecdotal evidence of positive effects on attitudes toward school and work abounds.

Work experience programs are also available at the community college level and for some are a direct extension of high school programs. Though not nearly as many students participate in these programs at the postsecondary level, the anecdotal evidence about program effects is also positive.

The success and expansion potential of work experience programs is still to be ascertained. A common criticism of these programs is that there is no system to credential graduates or completers. Without a standard set of credentials, employers cannot evaluate the skills of potential employees. Many researchers, policymakers, and employers argue that for work experience programs to succeed on a larger scale, some system for signaling the labor market about the skill level of individuals is necessary. The further development of new apprenticeship programs will also require addressing the reservations that many employers have about participating in them. Rigorous evaluation of the outcomes of work experience programs is needed.

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PART V

THE EMPLOYMENT OUTCOMES OF VOCATIONAL EDUCATION

CHAPTER 15

EMPLOYMENT OUTCOMES

INTRODUCTION

This chapter examines the economic outcomes associated with vocational education. Specifically, it investigates wage rates and employment patterns of those who received vocational training in high school and in subbaccalaureate postsecondary institutions. When possible, information on graduates of four-year postsecondary vocational college programs is included in the discussion.

Both high school and postsecondary vocational education systems serve a disparate clientele and offer a variety of coursetaking options. Their diversity complicates analysis of factors associated with economic outcomes. Vocational courses are provided to an economically, racially, and ethnically diverse population; individuals vary substantially in the amount of coursework they complete, the types of skills they acquire, and the degree to which they concentrate their coursework in a single program area. Additionally, vocational training at the postsecondary level is provided in an assortment of public and private institutions. Because the economic outcomes of students from vocational programs may be affected by such disparity, any analyses of outcomes ideally should account for its influence.

Factors of diversity notwithstanding, the findings reviewed in this chapter were compiled from a growing literature designed to measure the effects of vocational education on the labor market performance of individuals.[1] The four most common data sources for the studies are the *National Longitudinal Study of Youth* (NLSY), the *High School and Beyond* (HSB) survey, the *Survey of Income and Program Participation* (SIPP), and the *National Longitudinal Survey of the High School Class of 1972* (NLS72). Each source collects information on vocational attainment, wages, and employment, as well as on demographic and socioeconomic characteristics of individuals over time. In addition, the results of several special studies that have been conducted for the Assessment are discussed in this chapter.

Most of the studies reviewed have employed some type of statistical technique, most often regression analysis, to isolate the effects of particular factors on either the wages or the employment patterns of vocational trainees. The remainder of this chapter reviews the factors most often associated with labor market outcomes for secondary and postsecondary students, including:

- How the match between training and employment affects outcomes;

- How outcomes differ by concentration of coursework (in a single program area);
- How outcomes differ for those who completed programs compared with those who did not;
- How the level of a degree (B.S., A.A., certificate) affects outcomes;
- How outcomes differ by field of study;
- How the type of institution where the degree was earned affects economic outcomes;
- How outcomes differ for men and women; and
- How vocational coursetaking affects the outcomes of disabled students.

The goal of this chapter, then, is to determine the extent to which students' successes in the labor market are tied to particular aspects of their vocational experiences. There does not appear to be a general consensus in the literature on the overall influence of vocational education on economic outcomes; the evidence appears to be mixed. Some recent studies have found a positive correlation between employment earnings and vocational training, [2] while earlier work shows mixed or negative economic results from the programs themselves. [3]

Such contrary views, however, may be due in part to the fact that the methodological approaches used in these studies have evolved over time. Because early studies tended to review aggregate data for individuals who participated in vocational education programs, the information generally used was cross-sectional, providing a snapshot of earnings and employment characteristics at only one point in time.

In general, this **early work** on the economic outcomes of vocational education demonstrates few positive effects. Campbell and associates [4] summarize the literature by saying "the evidence is mixed as whether male vocational educated high school graduates earn significantly more/hour or more/week than otherwise similar non-vocational graduates" (p. 13). The findings are similar for the postsecondary market. In a review of earlier studies, Grubb [5] found that individuals with subbaccalaureate credentials tended not to earn more than high school graduates of equivalent experience. Lewis, et al. [6] report similar results. Although such early studies did not find improved economic outcomes for men, they did demonstrate that both high school and postsecondary vocational education show positive effects on earnings for women.[7]

Later studies improved upon early methodology in three important ways. First, researchers began to look at outcomes for subgroups of the vocational education population (e.g., degree holders vs. nondegree holders) to observe whether the results of the aggregate analyses masked gains for certain subpopulations. Second, researchers began employing more sophisticated statistical methods to sort out the effects of a variety of factors on economic outcomes (e.g., selection correction techniques). And third, longitudinal data that allowed researchers to follow the progression of individuals over time was introduced into analysis.

With increased technical sophistication, the results of later studies have been fairly consistent. For certain subgroups of secondary and postsecondary students, there appears to be evidence of a positive effect on wages and employment, when other important individual characteristics are controlled for via statistical techniques.[8]

The following summarizes the factors that have been associated with better employment and earnings outcomes:

- **Finding a job that matches a field of study.** The research consistently finds that wage and employment outcomes are superior for those whose field of study and occupation match, as compared to those without a match.

- **Concentration of coursework in a particular field of study.** Vocational education students who completed many courses in a vocational program area and find jobs related to their training have higher earnings and less unemployment over time than those with a more general background. In addition, individuals with higher concentrations of coursework are more likely to find a training-related job.

- **Program completion and certification.** Postsecondary vocational students who complete a course of study and attain certification (e.g., an associate's degree) have better employment outcomes than individuals who do not. There is also recent evidence that taking some postsecondary vocational courses without attaining a degree provides greater employment benefits than high school graduation alone.

- **Field of study**. The effects of high school and subbaccalaureate credentials vary according to fields of study. At the secondary level, women with training in business and health-related fields have improved wages and employment, and postsecondary completers with degrees in health and technical fields also show improved earnings. Though credentials in certain fields do appear to be related to better economic outcomes, many other fields show no such relationship.

- **The type of subbaccalaureate institution from which a degree or certificate is attained**. For postsecondary students, the type of institution (community college, private technical, public technical) where individuals study appears to affect economic outcomes. Studies consistently show that community college graduates are more likely to be employed and to use their vocational credits than are graduates from other types of institutions.

- **Gender**. Throughout all the studies, it appears that women who take vocational education courses have better economic outcomes, in terms of both wages and employment, than do their male counterparts. This effect is particularly strong for women in the fields of business and health who complete degrees and find jobs wherein they can use their vocational skills.

- **Vocational education for disabled students**. Secondary students with disabilities derive a number of benefits from vocational coursetaking, both in school and in the labor market.

The rest of this chapter reviews in detail the findings from the literature for each of the factors associated with improved economic outcomes for secondary and then postsecondary vocational education students. It also examines the evidence concerning the relation between participation in secondary vocational education and dropout rates, and takes a preliminary look at studies of the relation between **academic** skills and employment outcomes.

SECONDARY VOCATIONAL EDUCATION

Overall, the literature on economic returns from secondary vocational education shows few positive gains. In fact, most studies show that secondary school vocational education graduates do no better than their counterparts with general degrees. Studies by Ghazalah [9] that show strong and consistent benefits for vocational program completers in Ohio have methodological problems.

Ghazalah reported that "the results indicate predominantly higher incomes for graduates of all secondary and associates vocational programs in the study." In 1986, compared with similar groups in the general population, the mean incomes of secondary vocational graduates were 20 to 90 percent higher depending on field of study. Ghazalah's wage differentials are much larger than those found in any other study. One reason may be that the studies have no information on additional training and schooling that individuals may have acquired after completing high school. Many of the vocational completers in his study had no doubt obtained postsecondary education and training. The comparison group, by

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definition, did **not** receive postsecondary education or training. Hence, the higher wages and earnings reported may be due to the fact that some completers of vocational programs had obtained additional education.

The Match Between Training and Employment

Despite the lack of evidence of overall returns to secondary vocational education, there is evidence of beneficial employment outcomes when students find jobs related to their field of study. The strongest, most consistent finding throughout the literature is that benefits (improved earnings) do accrue in situations where vocational training is directly related to job tasks. To quote Medrich and Vergun,[10] "regardless of age or degree, employment outcomes were superior for those with a field of study-occupation match as compared with those without a match" (p. 7). As vocational training is designed to be relatively occupation specific, this finding is not surprising. It is understandable that the highest economic returns accrue to individuals who find employment in the occupation for which they are trained. Conversely, for vocational trainees whose jobs do not draw on their training, there are no apparent economic benefits. [11]

Measuring the relationship between coursework and job tasks requires a system to categorize and link both field of study and occupation. Researchers have therefore developed indices to measure the proportion of coursework utilized on the job. As part of the last National Assessment of Vocational Education, the Department of Education formulated such an index to test the hypothesis that increased coursework in job-related areas has positive economic outcomes.[12] That index, called the *course utilization rate* (CUR), measures the share of all vocational courses taken by high school students that are related to jobs they eventually obtain. The more vocational courses related to employment, the higher the index.[13] A second, related index, the *skilled job course utilization rate* (skilled jobs CUR), measures the share of all vocational courses that are related to the jobs obtained only when those jobs require more than minimal skills.[14] Throughout this section, we will report findings that rely on the CUR as well as the skilled jobs CUR.

The Number of Students Who Match Training and Employment

Bishop [15] reported that less than half of the high school graduates with occupational training obtain a job associated with their training. In a related study of graduates who have no postsecondary education, [16] found that 38 percent of all occupationally specific vocational courses were used in skilled jobs. From the low proportion of secondary vocational students finding a match between work and employment, Campbell et al. [17] concluded that one reason the earlier studies of aggregate populations did not find improved economic outcomes is that the majority of vocational graduates do not get training-related jobs.

Meyer [18] also reports that the course utilization rate varies by gender; and she finds that the course utilization rate is more than 10 percent higher for women than for men.

The Effect of Matching on Employment

These studies consistently show that for both secondary and postsecondary vocational completers with a job that matched the field of study, the likelihood of employment increases (i.e., the incidence of unemployment over time decreases).[19] Campbell, et al. [20] using data from the *High School and Beyond Survey*, reported that high school graduates who found a job that matched their field of study had a lower rate of unemployment (3 percent less), and spent almost 20 percent more time in the labor force than a comparison group of general track students. By contrast, those vocational track students who did not find a job that matched their field of study had no employment advantages over the general track students.

The Effect of Matching on Wages

Bishop[21] discovered a positive effect of secondary vocational education on wages for those employed in a job related to their field of study. He reports that the more relevant work experience an individual has, the higher the wages. Campbell, et al. [22] too, found higher wages for high school vocational education graduates with a match between field of study and employment. He reports that high school graduates earned 7–8 percent more, monthly, when their current job was related to their training.

Concentrations of Coursework

Another important finding revealed in this literature is that students who concentrate their coursework in a single area have better economic outcomes than those who take courses in a variety of subjects. This is true for both the secondary and postsecondary market. [23] The effects of course concentration appear to influence outcomes via the link between training and related jobs. That is, taking more courses in a major subject pays off only if work is in a related field. The more credits that trainees take in their major subject area, the higher the proportion of vocational education credits they used on their jobs, and the more likely they were to obtain a training-related job.

Campbell et al. [24] found that high school students who concentrated in a particular vocational field and obtained employment in a related field earned 7 to 8 percent more than vocational students who found employment in unrelated fields or students who completed a general track program in high school. Campbell also found that the probability of finding a training-related job (which pays higher wages) increases with course concentration. Approaching the same issue from the opposite direction, Wirt et al. [25] report that "for men, enrollment nonconcentration (not taking a coherent group of courses) was a consistently large source of course underutilization (23 percent in 1983)." This underutilization resulted in fewer job placements and lower wages.

Field of Study

Another potential explanation for the wide variation in economic benefits to vocational education is the possibility that the particular field of study affects wages and earnings and that looking at outcomes for the population as a whole masks the differences by field. The literature indicates that the effects of credentials do indeed vary by field of study.

Meyer [26], finds that women with high school vocational training most often receive degrees in business, health, and home economics. Those traditionally female fields have higher course utilization rates than the majority of traditional male subject areas. Therefore, completing a degree in one of the traditionally female fields yields positive economic outcomes.

The improved employment outcomes for women in secondary vocational programs seem to be driven by the high proportions of females (over 50%) who have business training and find jobs related to their training. Business education is the largest secondary vocational education program. The skilled CUR for women with business training was 53 percent in 1983 and 65 percent in 1985. By contrast, for men with jobs in precision production (largely T&I training), the skilled CUR was 27 percent in 1983 and 36 percent in 1985. [27] One qualification to the apparently strong outcomes for women in this field is that in recent years business enrollments have been declining, perhaps in response to reduced growth in secretarial jobs (see Chapter 4). Whether employment outcomes for women with business training are changing is unclear.

The demand for trained skills in the health field is expanding, however. Although there are relatively few health programs for women in secondary education, the payoff to training in this area is clear. Meyer [28] reported a skilled CUR of 71 percent for women in health fields.

Vocational Education for Students With Disabilities

One goal of the Perkins Act is to improve high school vocational education for students with disabilities. Vocational education may be particularly appropriate and beneficial to these students, because so few of them go on to postsecondary education. Wagner [29] observes that such students "often need training in both work-related behaviors and specific job skills, if they are to function effectively in the competitive job market when they leave high school" (p. 1).

Wagner et al. [30] explored the relationship of vocational education and school performance for students with disabilities. This analysis included a comparison of how students who took vocational education classes in high school fared in making the transition to adult roles and responsibilities, compared with other students. The data came from the *National Longitudinal Transition Study of Special Education Students* . The NLTS is a nationally representative sample of more than 8,000 students in all 11 Federal special education disability categories who were ages 13 to 21 and in special education in the 1985–86 school year.

SRI used the NLTS data to examine five outcomes that would indicate whether disabled students who took vocational education in their most recent year in secondary school were more likely to have experienced positive outcomes than nonvocational students, both during secondary school and in their early postschool years. The outcomes include school performance as measured by students' school attendance; grade performance as measured by whether students received one or more failing course grades; and persistence in school, as measured by whether the student dropped out. The postschool outcomes (for youth who had been out of secondary school for up to two years) included enrollment in a postsecondary vocational or trade school, and incidence of paid employment.

SRI researchers found a "consistent pattern of relationships between enrollment in occupationally oriented vocational education and better school performance. Students who had occupational training were absent from school significantly fewer days (1.5 days; $p< .05$) than students who did not have such training, other factors being equal. Similarly, students taking occupationally oriented vocational education were significantly less likely to drop out of school" ($p< .01$) when other confounding factors (such as disability and gender differences) were controlled. "The NLTS estimates show that the likelihood of dropping out rather than persisting in school was three percentage points lower for vocational students than for others. The analysis also indicates that vocational students were about three percentage points less likely than others to have failed a course, although this difference did not attain statistical significance."[31]

Wagner also noted that those youth who had been out of high school for up to two years and had taken secondary vocational education classes were 8 percent more likely to have attended a postsecondary vocational school in the previous year than were nonvocational students, controlling for other factors.

In addition, students who had taken vocational education in their last year in secondary school were 9 percentage points more likely to be competitively employed than youth who had not taken vocational education, other factors being equal. Wagner also reports that if the secondary vocational education included work experience, the likelihood of employment increased an additional 14 percent beyond the increased probability associated with vocational education enrollment alone.

Thus, the NLTS findings suggest that secondary school vocational education does appear to hold potential for improving both the school performance and postschool outcomes of disabled students. A later study by Wagner et al. [32] supported these initial findings, demonstrating that vocational coursetaking increases the likelihood of postschool employment for youth with mild disabilities (e.g., LD, speech, mild retardation) who have been out of school for one to three years. Their chances of employment increased by 19 points if they took some vocational education, but less than four courses within a specific vocational program area, and by 20 points if they took at least four courses in a specific vocational program area. In addition, the study showed increased monetary compensation for those with at least four courses in one area. The findings are particularly important because most disabled students have mild disabilities.

The Effects of Vocational Training on Dropout Rates

For many students, particularly those with low academic achievement, vocational education courses seem to be a welcome alternative to traditional classroom learning. In fact, it is often said that participation in vocational education reduces the dropout rates for at-risk high school students. This belief, coupled with the information that economic outcomes for high school completers exceed those of noncompleters, has generated a growing literature on the effect of vocational education on dropout rates.

From the literature, it is not clear that vocational education, per se, is successful in reducing the dropout rate for students in general, as distinct from disabled students. The results are mixed, with the majority of findings showing either no effect or a negative effect.

The results of a nationally representative study of the effect of vocational education on preventing dropouts, using data from the *National Longitudinal Study of Labor Market Experiences-Youth* (NLS-Y), found higher graduation rates for vocational education students. [33] Restricting the sample to students who were considered likely to drop out of school, the use of regression analysis by Mertens et al. demonstrated that more vocational courses were related to higher graduation rates. The result, however, was statistically significant only in grades 10 and 12, and the magnitude of the effect was rather small. The authors report, though, that taking and passing vocational courses in 9th, 10th, **and** 11th grades (i.e., at least three courses) increased the high school completion rate of likely dropouts from 64 percent to 70 percent. Whether this result is an effect of vocational education or selection bias is clearly a question. Students who take vocational courses in these sequential years and who complete the 11th year of high school may just be more persistent than others in the analysis.

Three separate studies, relying on the High School and Beyond (Sophomore cohort) data, found little evidence of reduced dropout rates. In the first study, Pittman [34] matched dropouts with completers in the same cohort on five variables: (1) reading comprehension, (2) socioeconomic status, (3) gender, (4) region, and (5) community size. He performed a path analysis and found that participation in vocational and business courses was not related to persistence in high school. (The factors that were associated with persistence were related to the student's social relationships within the school: peer interest, sense of social belonging, and relationships with the school staff.) Pittman also found that higher levels of participation in vocational education increased students' subjective measures of the utility of their education, but this did not increase persistence rates.

The second study on these data, by Catterall and Stern, [35] restricted the sample to the approximately 3,000 participants who went to high school in California. The study used three approaches to analyze the effects of vocational education on dropping out. The first isolated the students who stated, in their sophomore year, some doubt about finishing high school. Within this group, the more vocational courses a student took, the more likely he or she was to drop out of high school. The second procedure used a logistic regression to predict dropouts. This procedure "found no consistent, significant association between dropping out (or staying in) and participation in concentrated vocational education or alternative programs." [36] The third procedure used the high school as a unit of analysis. This analysis found that dropouts were less likely to take concentrated vocational education. Not controlling for other factors, the analysis also found that schools with more dropouts tended to have larger proportions of students taking vocational courses or other alternatives to more standard courses.

The third study, by Weber, [37] used the High School and Beyond (Sophomore cohort) data, and also relied on matched groups. In that study discriminant analysis was used, and it was found that dropouts were less likely to report being in the vocational curriculum than the comparison group.

Another study of 11 California Peninsula (Vocational) Academies that serve as dropout prevention programs also used matched comparison groups to evaluate dropout rates. [38] Students were selected for the academies because they were considered at high risk for dropping out. The project required school districts to identify and track a comparison group of statistically identical students. The simple dropout rate of the academy students was lower than that of the comparison group, [39] but the dropout rate was not statistically lower for the academy group when other factors are controlled for.[40]

In sum, this work on dropout preventions does not point to vocational education as a significant intervention that reduces dropout rates. It appears that students who stay in school, even though they are at risk of dropping out, do so because of social and psychological factors not necessarily related to the curriculum.

Returns to Basic Skills

For years businesses responding to surveys have said that they are looking for high school graduates with strong basic skills and character traits such as personal responsibility, honesty, and desire to work (see Appendix 12-A.) Consistent with these findings, the SCANS report [41] defines a set of "foundation skills" (basic skills, thinking skills, and personal qualities) that are thought to be essential in workforce preparation. In addition, SCANS identifies five "workplace competencies," such as understanding systems and understanding technology, that are thought to be essential (see Appendix 9-A). Chapter 9 discusses the findings of a study that related SCANS skills to performance in the utilities industry. [42] Essentially, the foundation skills, as reported by employees and supervisors, were significantly related to job performance as reported by supervisors. However, only one of the workplace competencies — information management — was significantly related to performance. These findings and other research raise the question of what basic academic skills, and by extension other academic skills, contribute to employment outcomes for students with a given level of education — in this case, high school graduates.

More broadly, it is important to assess the returns to academic education because doing so will be helpful in determining what mixes of academic and vocational courses are most suitable for the workforce preparation of high school graduates not pursuing baccalaureate degrees. A review of the literature on returns to academic skills is currently being conducted, and its findings will be included in the Final Report. At present, we can report on one recent study on the subject.

To explore the issue of how one basic skill — math — affects the wages of graduating high school seniors (with no further education) Murnane et al.[43] compared the wages of 24-year-olds who graduated in 1972 with those of 24-year-olds who graduated in 1980. Each group had been out of high school six years. The math skills that were measured required no knowledge of geometry or advanced algebra and should have been taught no later than the eighth grade. Using data from NLS72 and High School and Beyond, the researchers estimated that between 1978 and 1986, "the premium for mastery of elementary mathematics skills rose from $.46 per hour to $1.15 for men (in 1988 dollars) and rose from $1.15 to $1.42 for women after years of schooling are controlled" (p. 1). Evidently basic math is becoming more valuable in the labor market. The authors concluded that a mastery of basic math skills will become an increasingly important determinant of wages in future years.

Murnane et al. also found that mastery of basic math skills has a much smaller impact two years after graduation than six years after graduation. The fact that the benefits to investing in basic math skills accrue over a periof of years may act as a disincentive for students to work hard in school, as the promise of long-term returns may be too elusive a goal for many high school students.

These findings suggest that basic academic skills are indeed important in labor market outcomes. Research on employment outcomes associated with a broader range of academic skills will be included in the Final Report.

Selection Bias

Although the results of these studies consistently find that high school vocational graduates who find jobs that match their field of study have improved economic outcomes, the issue of selection bias still clouds the results. In all of the studies reviewed, it is possible that some unmeasured characteristics of students, such as motivation and ability, affect (a) the likelihood of enrollment in vocational education and (b) their subsequent performance and success in the labor market.

In other words, we cannot be sure that those vocational education students who show improved economic outcomes would have been any less successful without their vocational training. By employing sophisticated economic techniques, many of the more recent studies attempt to control for selection bias.[44] Yet, short of a controlled experiment wherein individuals are randomly assigned to a vocational track or a general track, there is no means to completely control for this type of bias. This problem is endemic to systematic research on individual outcomes, and should be kept in mind in interpreting the results of these studies.

POSTSECONDARY VOCATIONAL EDUCATION

Vocational Education at the postsecondary level is quite different from vocational education in high school. First, and probably most importantly, postsecondary education is voluntary, whereas secondary education is mandatory (at least through age 16). Additionally, compared with high schools, postsecondary vocational education takes place in a variety of environments such as two-year and four-year colleges, as well as in proprietary and technical institutions. Finally, the range of credentials, as well as the variety of subjects studied, is much broader at the postsecondary level. The diverse nature of the programs offered adds many dimensions to the analysis of economic outcomes for postsecondary students. For that reason, the remainder of this chapter reviews the literature on economic outcomes for postsecondary vocational education students, expanding upon the topics covered for secondary education to include important aspects of postsecondary vocational education.

The Match Between Training and Employment

Again, the most striking evidence in this literature is that postsecondary vocational students who find a match between their training and employment show improved economic outcomes even when controlling for other factors. The evidence also indicates that the economic gains to postsecondary vocational students outweigh those of secondary students, as a larger proportion of postsecondary students are successful at finding jobs that match their training.

The Number of Students Who Match Training and Employment

Medrich and Vergun [45] found that 61 percent of those aged 18–34 who had attained a postsecondary degree in a vocational field achieved a match with field of study. They also reports that a match of field of study and occupation at one point in time was likely to mean a match throughout the study period. Goodwin[46] found that 58 percent of postsecondary vocational coursework was used on the job. Grubb, [47] too, found positive effects of matching training and employment, but he noted that matches also differ by type of credential. He estimates that 76 percent of men with certificates are able to match jobs and training, but only 22 percent of men with vocational associates degrees can do so. The comparable figures for women are 67 percent and 45 percent, respectively.

The Effect of Matching on Employment

Matching training and employment also appears to improve employment outcomes. Using data from the SIPP (1990 Panel), Medrich and Vergun [48] found that during a 91-week period, 76.5 percent of vocational education graduates with a job related to the field of study were employed the entire period, as compared with 63.9 percent whose jobs did not match their coursework. Goodwin [49] also found a lower incidence of unemployment among those who had a match between jobs and schooling.

The Effect of Matching on Wages

Medrich and Vergun [50] found higher wages for postsecondary students 18–34 years old with vocational degrees and job-training matches (compared with degree completers who did not find a job that matched their training). Breaking earnings into three categories (less than $900/month, $900–2000/month, and greater than $2000/month), they report that 7 percent of those with a match earned less than $900 a month, and 15 percent of those without a match earned less than $900. At the upper end of the distribution, 62 percent of those who had achieved a match earned $2000 a month, whereas only 54 percent of those who did not find a match realized such earnings.

At all levels of vocational training, Medrich and Vergun found that women were less likely than men to have earnings over $2000 a month. Yet, for full-time employed females, 59 percent with a field of study and job match earned over $2000 a month, whereas only 31 percent of women without a matched job received that level of compensation.

Using multivariate analysis, Goodwin [51] also found that the more one's training is related to one's job, the higher the wages. (See the next section.)

Concentration of Coursework

It appears that benefits from vocational training are positively correlated with the amount of training received and the coherence of the program. The positive returns to taking additional courses in a single subject area include increased earnings and decreased unemployment. In a study of individuals with postsecondary vocational training (using data from the senior cohort of HSB) conducted by Goodwin, [52] a higher level of participation in the vocational education major was associated with a significantly lower incidence of unemployment and a greater probability of being employed in one's chosen field.

Goodwin reports that students who took less than 12 vocational credits were 28 percent more likely to be unemployed than those who took more than 30 credits. As the number of credits in the field of concentration increased, the unemployment rate decreased from 20.5 percent for individuals with only a few credits to 16.3 percent for those with 30 credits. Each additional 30 credits (i.e., a full year of coursework) lowered unemployment by 6 percent. This analysis found that vocational subject credits taken outside of the major field of study do not contribute to a lower incidence of unemployment.

This same study also indicates a positive effect on wages from additional credits in a major field. As the number of completed courses related to the job held increased, so did hourly earnings. Using regression analysis, the estimated wages were $1.00/hr. higher ($7.42/hr.) for trainees with 30 matched credits, compared to those who used little of their skills on the job ($6.59/hr. for less than 12 matched credits). Furthermore, each additional 30 credits yields a 12.2 percent increase in hourly wages. Yet, only about one quarter of vocational trainees complete more than 30 credits. As before, this analysis shows that additional vocational courses not related to the field of study do not contribute to improved earnings.

Goodwin also examined the relationship between the number of credits in the major subject area and the proportion of course skills used on the job. Comparing students with few vocational credits (12 or fewer) to those with a moderate number (13 to 30), he finds that students with moderate training are more likely to be in training-related jobs. Likewise, the CUR for the entire sample is 58 percent. For trainees with 12 or fewer related credits, the CUR is 50 percent, whereas for students with 13–30 related area credits, the CUR increases to 58 percent. For each additional 30 credits taken in the subject area, the CUR increases by 5 percent.

Completion of a Degree or Certificate

The literature indicates that persons completing a postsecondary degree in a vocational field have higher earnings than persons who do not earn a degree.[53] Several recent studies also show that postsecondary vocational coursetaking without a degree yields greater employment benefits than high school graduation alone.[54]

Medrich and Vergun's analysis [55] discovered that a high proportion (61%) of those attaining a postsecondary degree in a vocational field found a match between field of study and occupation, leading to better employment outcomes. Goodwin, [56] too, found that among persons who completed a degree, approximately 58 percent had obtained a job related to their field of study. Again, those whose jobs were related to their postsecondary field of study experienced higher returns to education. For men who had completed an associate's degree, Goodwin found increased earnings, though still significantly less than for a baccalaureate degree.

Using NLS72 data controlled for family background, Grubb found that vocational certificates did not significantly increase wages or earnings for men in 1986, but did for women. [57] His analysis of the SIPP data (25–64 year-olds) showed that earnings *are* statistically higher for both men and women with vocational certificates in both of the years he analyzed (1984 and 1987).

Lewis et al. found positive and significant earnings payoffs for both participation in and completion of associates degrees in vocational education, compared to the outcomes of high school graduates with no further education. [58] They state that their results are consistent with "the possibility that early leavers have acquired enough training for a specific job and can therefore earn as much as can completers." [59] Kane and Rouse also addressed this issue. [60] They analyzed NLS72 and NLSY data and found positive wage benefits for community college students, even if they do not complete an associate's degree. Grubb [61] also looked at the effect of completing a degree compared with completing the same number of credits that do not lead to a credential, to ascertain whether a degree in and of itself leads to higher earnings. He determined that men derive earnings benefits from vocational coursetaking, but no additional benefit from completing a degree. Women, on the other hand, tend to benefit from earning a degree, but not from coursetaking alone.

Level of Degree

The level of the degree attained also appears to affect the economic outcomes of vocational trainees. Medrich and Vergun [62] find that a larger proportion of those with a baccalaureate degree or higher, compared with an associate's degree or vocational certificate, have high earnings (over $2000/month).

Like Medrich and Vergun, Grubb[63] concludes that the strongest effects of completing a degree are at the baccalaureate level. He estimates that for vocational credits from a four-year institution, each related credit increases earnings by $241, even after controlling for other variables.

For women, Grubb reported a different pattern. The baccalaureate degree still carries the highest returns, increasing earnings by almost 50 percent, when compared to women with high school diplomas. However, both certificates and associate's degrees also increased wages significantly for women, relative to earnings of women with a high school diploma.

Field of Study

In analyzing both the NLS72 and the SIPP, Grubb[64] finds that the returns to vocational education vary substantially with type of degree. For men, he finds positive effects of associate's degrees largely in gaining access to careers in the health and technical fields. He also finds that public services and trade and industry credentials have positive effects. For women, he finds increased earnings from business and health-related fields, as well as from technical associate's degrees. For other fields of study, including academic subjects, he finds no statistically significant returns.

Type of Institution

Several of the studies considered in this chapter also examined outcomes for postsecondary vocational education students by the type of institution they attended. The assumption is that if there are systematic quality differences across institution type, one might expect to see differences in economic outcomes for individuals with the same level of education attainment.

The evidence of the economic effects of proprietary schools is mixed. There is some evidence that completion rates are higher than in other institutions, but this does not hold when the analysis controls for background factors. The evidence of employment outcomes is also inconclusive. Proprietary completers seem to have higher unemployment, but those who find jobs apparently get higher wages and better annual earnings.

Goodwin[65] and Lyke et al.[66] found that, when background factors were controlled for, unemployment rates were higher for proprietary school students than for students who had attended comparable institutions. The differences also were statistically significant. Goodwin, using data from the High School and Beyond (senior cohort), reports that the type of postsecondary institution (subbaccalaureate) is related to the average incidence of unemployment for trainees in the labor market. Individuals who attended proprietary schools (27.7%) were more likely than those at community colleges (18.9%) or public technical schools (16.5%) to be unemployed, and were less likely to use their training on the job.

Goodwin also found that those from community colleges or public technical institutes experienced similar rates of employment and likelihood of using their vocational training on the job. For individuals who take 30 credits of postsecondary training, those who attend proprietary institutions are significantly more likely to experience unemployment than students who attend community colleges. Furthermore, students at proprietary schools also have lower CURs (53%) than do their counterparts in community colleges or public technical schools (both 60%).

On the other hand, wages and annual earnings of employed proprietary completers are substantially higher in two studies.[67] Bishop et al.[68] found that proprietary graduates are paid 4% more in their initial employment, while Wilms[69] found that proprietary students earn more on their first job, but that their later earnings are not significantly higher than comparable graduates from other institutions. The only significant differences in the wages by type of institution found by Goodwin[70] were that students from public technical institutes earn about 11 percent less than students from community colleges, and 20 percent below students from proprietary schools.

As for completion rates, Richard Moore[71] reviewed the research that analyzes the outcomes of proprietary schools and comparable public programs.[72] All but one of the studies that analyzed completion rates found substantially higher rates for proprietary schools when compared to similar programs in the public sector. However, this effect disappeared when the completion rate was corrected for different background factors of students at different types of institutions.[73] Moore says that proprietary schools have incentives to move students through the program quickly, and that their programs are designed with completion in mind. Data support this theory.

Goodwin concluded, as did Grubb,[75] that the type of institution does not tell the entire story. If the story can be told at all, it will be through the interaction of a variety of factors, including number of related courses, type of institution, and field of study.

CONCLUSION

This chapter has reviewed the literature on economic returns to vocational education for secondary and postsecondary students. That literature relies primarily on four data sources (NLS72, HSB, SIPP, and the NLSY), each of which provides a slightly different picture of the outcomes from vocational training (e.g., some are longitudinal, while others measure outcomes at a point in time; some rely on self-reported data on vocational coursework, while others rely on transcripts), making comparisons across studies somewhat difficult, and causing outcomes to appear quite variable.

What we do find throughout the studies examined is that, for certain groups of individuals who received vocational training, economic outcomes, in terms of wages and employment, are better than for similar individuals without vocational training. This is true in both the secondary and the postsecondary vocational population, and the effects are almost always stronger for women.

The following list highlights the findings from this chapter:

- Most importantly, we find wage and employment outcomes superior for those with field of study and occupation matches, as compared to those without matches. Unfortunately, less than 40 percent of secondary graduates are able to find a job that matches their training, limiting benefits to a fairly small group. Postsecondary students (almost two-thirds) are more likely than secondary students to find a job that matches their training.

- Trainees who ultimately derive the greatest benefits from their vocational experiences take many vocational courses in a coherent program of study, and are more likely to find jobs that utilize their training than those with only a few vocational credits, or those with many credits in a variety of fields. This is true for both secondary and postsecondary vocational trainees.

- Those who complete a postsecondary program of study tend to have better economic outcomes than individuals who do not. Taking some postsecondary vocational courses may also provide greater benefits than high school graduation alone.

- The level of the degree attained affects economic outcomes. Those with baccalaureate degrees gain the most in terms of wages and employment. For completers of vocational education degrees or certificates, women are much more likely than men to find a match of employment and training, hence improving economic outcomes. The economic benefits to completing a degree seem to depend upon a combination of factors, including type of institution where the degree was earned and field of study.

- Specific fields of vocational study are related to economic outcomes. At both the secondary and postsecondary level, men and women with degrees and certificates in business or a health-related field achieve improved wages and earnings. In addition, women with technical associate's degrees fare better than most men or other women.

- The type of institution where individuals study affects economic outcomes. Studies consistently find that community college students are more likely to be employed and are more likely to utilize their vocational credits than trainees from other types of institutions.

- Throughout this review, findings demonstrate that economic outcomes for women with vocational credentials surpass those for men, even controlling for other intervening factors. Women are more likely to improve their wages and earnings with vocational training; they are more likely to find a match of training and employment; and they are more likely to benefit from completing a degree, at all levels.

- For high school students with disabilities, participation in vocational programs appears to improve academic performance, reduce dropout rates, and improve the likelihood of employment after school completion.

- Evidence of the effect of vocational education programs on reducing the high school dropout rate is mixed, but tend not to show a positve effect.

What has become apparent from reviewing vast literature is that further work is needed to sort out the complicated and often contradictory findings regarding the economic returns to vocational education. Many of the studies reviewed reveal that it is the interaction of a variety of factors that predicts economic success. Until researchers can isolate those effects, or better understand the interaction between key factors, conclusions about the effects of vocational education will remain tentative.

ENDNOTES

1 For example: Grubb, W.N., (1993b), "The Economics Effects of Sub-Baccalaureate Education: Corrections and Extensions," Unpublished draft; Bishop, J. (1989), Occupational training in high school: When does it pay off? *Economics of Educational Review, 8(1)*, 1–15; Medrich, E., & Vergun, R. (1993), *Earnings and Employment Outcomes for Postsecondary Degree Holders in Vocational Subject Areas*, Berkeley, CA: MPR Associates; Lewis,D., et al. (1993), Efficiency and equity effects of vocational focused postsecondary education, *Sociology of Education, 66* (July); Meyer, R., in Muraskin, L.D. (1993), "Secondary Vocational Education: Availability, Coursetaking, and Outcomes," document in preparation; Goodwin, D. (1989), "Postsecondary Vocational Education," *National Assessment of Vocational Education*, Final Report, Vol. 4.

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4 Campbell, et al. (1986), *Outcomes of Vocational Education for Women, Minorities, the Handicapped, and the Poor*, Columbus, OH: National Center for Research in Vocational Education.

5 Grubb, W.N., (1992), Postsecondary vocational education and the sub-baccalaureate labor market, *Economics of Education Review, 11*, 225–248.

6 Lewis, et al. (1993).

7 Bishop (1989).

8 Grubb (1992); Lewis, et al. (1993); Medrich & Vergun (1993); Meyer, R., in Muraskin (1993); Goodwin (1989); Ghazalah, I.A. (1987), "Long-Term Follow-Up of Vocational Education Graduates: A Study Based on Federal Income Tax Data," Unpublished manuscript, Athens, OH: Ohio University, Department of Economics; Bishop (1989).

9 Ghazalah (1987); Ghazalah, I.A.. (1991), *1979 Vocational Education Graduates in 1986*, Athens, OH: Ohio University.

10 Medrich & Vergun (1993).

11 Bishop (1989); Grubb (1992); Meyer, R., in Muraskin (1993).

12 Wirt, J., et al. (1989), *National Assessment of Vocational Education: Summary of Findings and Recommendations*, Final Report, Vol. 1.

13 To compute the CUR, a matching matrix that identifies training-program-to-occupation matches for vocational education and employment was developed. It includes thousands of vocational course and program titles, as well as hundreds of census occupational titles.

14 Wirt, et al. (1989).

15 Bishop (1989).

16 Wirt, et al. (1989).

17 Campbell, et al. (1986).

18 Meyer, R., in Muraskin (1993).

19 Rumberger & Daymont (1984); Campbell, P.B., et al. (1987), Stern, et al. (1993).

20 Campbell, et al. (1987).

21 Bishop, J. (1991), I*mpact of Previous Training in Schools and on Job Productivity*, (Working Paper 91–27), Ithaca, NY: Cornell University, Center for Advanced Human Resource Studies.

22 Campbell, et al. (1986).

23 Bishop (1989); Muraskin (1993); Campbell, et al. (1987); Wirt, et al. (1989).

24 Campbell, et al. (1987).

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CHAPTER APPENDICES

CHAPTER 1 APPENDIX

Table A-1.1
National Assessment of Vocational Education Research Topics by Data Collection Methodology

				Education Research Centers					
	Omnibus Surveys and Case Studies	Tribal Case Studies	Funding Case Studies	Natl. Center Research in Vocational Education	Education Finance Center	Education Quality Workforce Center	Analysis of ED/HHS Surveys	Other Surveys	Literature Reviews
Perkins Funding and Implementation									
State and local practices	X								
Intrastate funding	X		X		X			X	
Interstate funding					X				
Student Participation									
Access and enrollments	X						X		X
Participatory planning	X								
Services for special populations	X								X
Sex equity	X							X	
Program Characteristics and Improvement									
Vocational teachers and classes							X	X	X
Education reform	X			X					X
Performance standards	X			X					
Integration	X			X					X
Tech-prep	X			X					
"All aspects of the industry"	X								
Work-based education	X			X					X
Academic outcomes							X		X
Vocational Education and Employment									
Employment outcomes						X	X		
Employer satisfaction								X	
Economic context of vocational education									X
Special Studies									
Coordination with JTPA	X			X					
Tribal education		X							X
Correctional education								X	X
Vocational student organizations	X						X	X	

JTPA = Job Training Partnership Act

Table A-1.2
Content of the National Assessment of Vocational Education Omnibus Surveys

	SD	PD	DA	DB	DV	SS	PS
Administrative responsibilities/ institution type	X	X	X	X	X	X	X
Enrollments	X	X	X	X	X	X	X
Staffing	X	X	X	X	X	X	X
General funding	X	X	X	X	X		X
Distribution or use of Perkins funds	X	X	X	X	X		X
Steps taken to integrate academic and vocational education	X	X		X	X	X	X
Steps taken to implement "all aspects of the industry"	X	X		X	X	X	X
Steps taken to develop tech-prep	X	X		X	X		X
Steps taken to develop and implement vocational performance standards and measures	X	X		X	X		X
School-to-work programs	X	X				X	X
Coordination with JTPA	X	X	X		X		X
Effects of education reform on vocational education	X			X	X		
Services for special population students—current and changes			X			X	X

SD = Survey of State Directors of Secondary Vocational Education
PD = Survey of State Directors of Postsecondary Occupational/Technical Education
DA = Survey of Public Secondary School Districts, Version A
DB = Survey of Public Secondary School Districts, Version B
DV = Survey of Vocational School Districts
SS = Survey of Public Secondary Schools
PS = Survey of Two-Year Public Postsecondary Institutions

CHAPTER 3 APPENDIX

Table A-3.1
Median Amounts of Total Perkins Funds and of Title II Funds for State Administration, by Level of Education

	All	Postsecondary Vocational Education
Median Amount of:		
Total Perkins funds in 1991–92	$14,701,340	$4,959,263
Total Perkins funds in 1990–91	$13,978,476	$4,427,436
Growth rate 1990–92 (percent)	7.3	14.5
Median Amount of:		
Perkins funds allocated to state administration in 1991–92	$629,499	$83,000
Perkins funds allocated to state administration in 1990–91	$979,613	$97,085
Growth rate 1990–92 (percent)	-27.6	-28.4
Median share of state administration funds in total Perkins funds 1991–92 (percent)	4.4	2.6
Median share of state administration funds in total Perkins funds 1990–91 (percent)	6.6	3.8
Growth rate 1990–92 (percent)	-33.4	-31.5

Sources: Omnibus Surveys of Secondary and Postsecondary State Agencies

Table A-3.2
State Employees, Budget Per Employee, and Assignments By Extent of Major Job Shifts, 1987, 1990, 1992

	Median Percent of Employees with Major Job Shift							
	State Secondary Office				State Postsecondary Office			
	0	1–10	10–30	>30	0	1–10	10–30	>30
Median number of FTE employees in 1992	23	32	29	34	20	72	17	68
Growth rate 1990–92	-8	-11	-20	-28	0	-2	6	-3
Growth rate 1987–90	0	-4	0	-9	2	4	0	4
Median operating budget in FY92 (in $million)	$12.1	$27.1	$32.0	$10.0	$7.8	$51.4	$16.0	$101.2
Growth rate FY91–FY92	5	4	2	0	3	14	20	0
Median budget per FTE worker in FY92 (in $1,000)	$484	$511	$1,097	$833	$504	$590	$1,579	$1,874
Growth rate FY91–FY92	11	21	26	41	5	10	9	-1
Median percent of employees spending most of their time on vocational education (1992)	100	94	80	76	30	25	50	35

Source: Omnibus Surveys of Secondary and Postsecondary State Agencies

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Table A-3.3
Percent of Secondary State Vocational Education Agencies Reporting Changes in Staff Responsibilities, 1990 to 1992, by Type of Activity

Activity	Increase	Decrease	No Change	No Activity
Local program certification	28.6	12.5	46.4	12.5
Curriculum development	39.3	25.0	33.9	1.8
Textbook review	5.4	7.1	41.1	46.4
Technical assistance	53.6	12.5	33.9	0
State rules enforcement	14.3	14.3	67.9	3.6
Funds distribution/ monitoring	57.1	5.4	37.5	0
Development of student performance	78.6	1.8	14.3	5.4
Evaluation of local programs	25.0	30.4	42.9	1.8
Data collection	42.9	7.1	48.2	1.8
Teacher certification	5.4	7.1	69.6	17.9
Responsibilities for special populations	60.7	1.8	33.9	3.6
Responsibilities for VSO	17.9	12.5	67.9	1.8
Responsibilities for business/labor partnerships	57.1	3.6	35.7	3.6

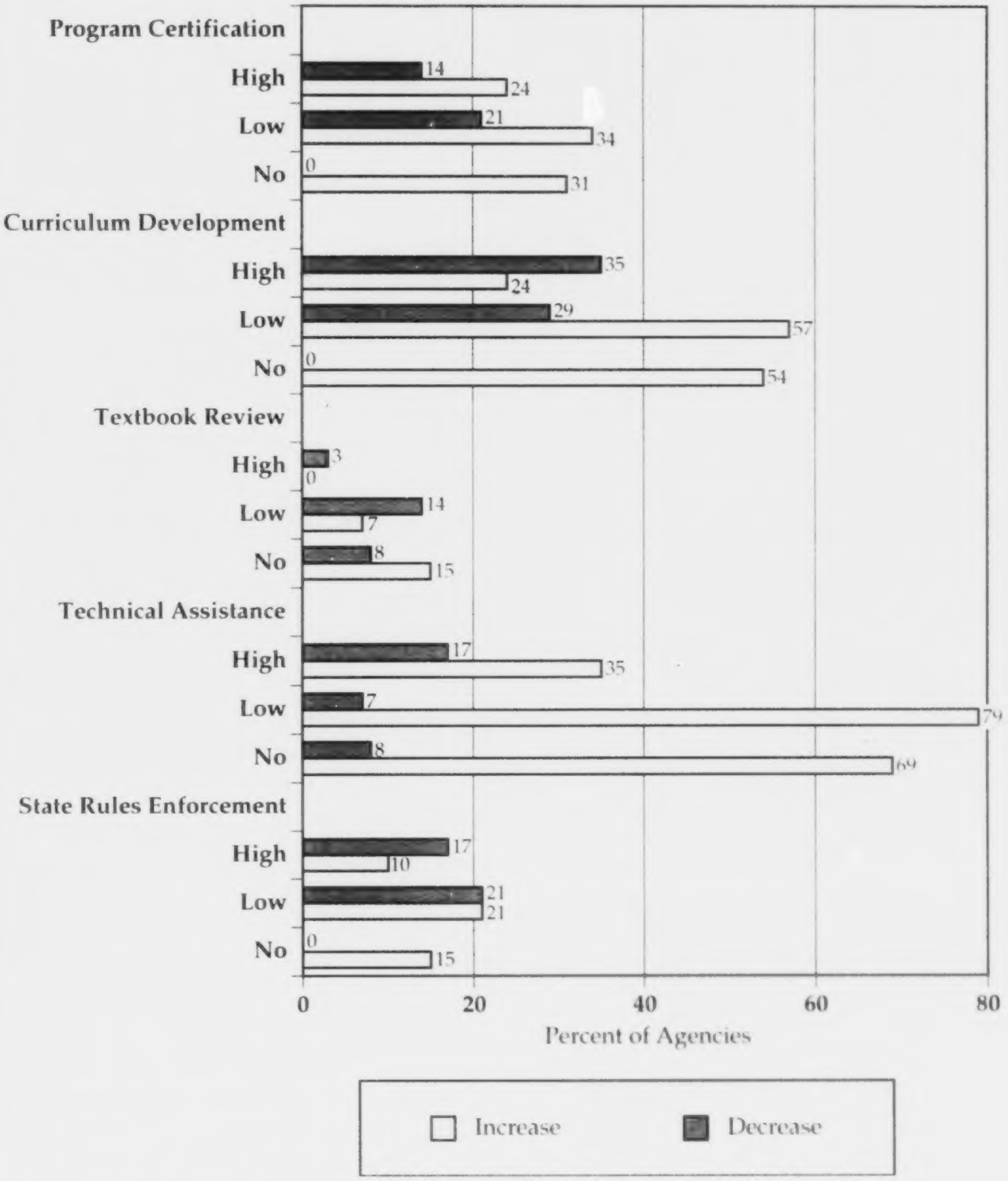
Source: Omnibus Survey of Secondary State Agencies

Table A-3.4
Percent of Postsecondary State Vocational Education Agencies Reporting Changes in Staff Responsibilities, 1990 to 1992, by Type of Activity

Activity	Increase	Decrease	No Change	No Activity
Local program certification	29.2	8.3	54.2	8.3
Curriculum development	33.3	10.4	50.0	6.3
Textbook review	6.3	0	22.9	70.8
Technical assistance	50.0	8.3	37.5	4.2
State rules enforcement	25.0	2.1	72.9	0
Funds distribution/ monitoring	52.1	6.3	39.6	2.1
Development of student performance	79.2	0	14.6	6.3
Evaluation of local programs	36.2	2.1	59.6	2.1
Data collection	66.7	0	33.3	0
Teacher certification	6.5	2.2	32.6	58.7
Responsibilities for special populations	66.7	2.1	29.2	2.1
Responsibilities for VSO	0	8.7	60.9	30.4
Responsibilities for business/labor partnerships	47.9	2.1	43.8	6.3

Source: Omnibus Survey of Postsecondary State Agencies

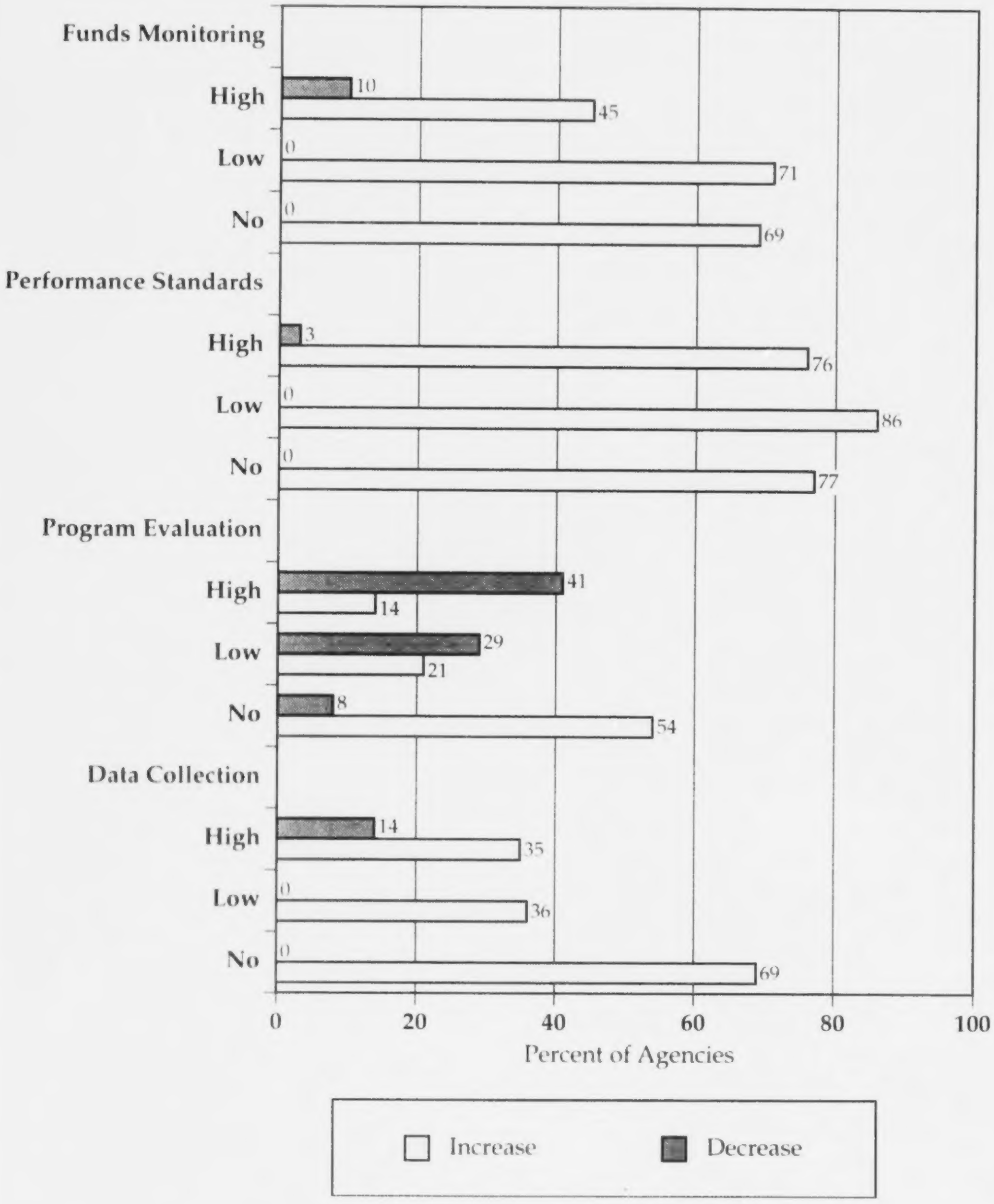
Figure A-3.1
Changes in Responsibilities at Secondary State Agencies, by Level of Staff Reduction



High — Offices with staff reduction of 15 percent or more
Low — Offices with staff reduction of less than 15 percent
No — Offices with no staff reduction or an increase

(continued)

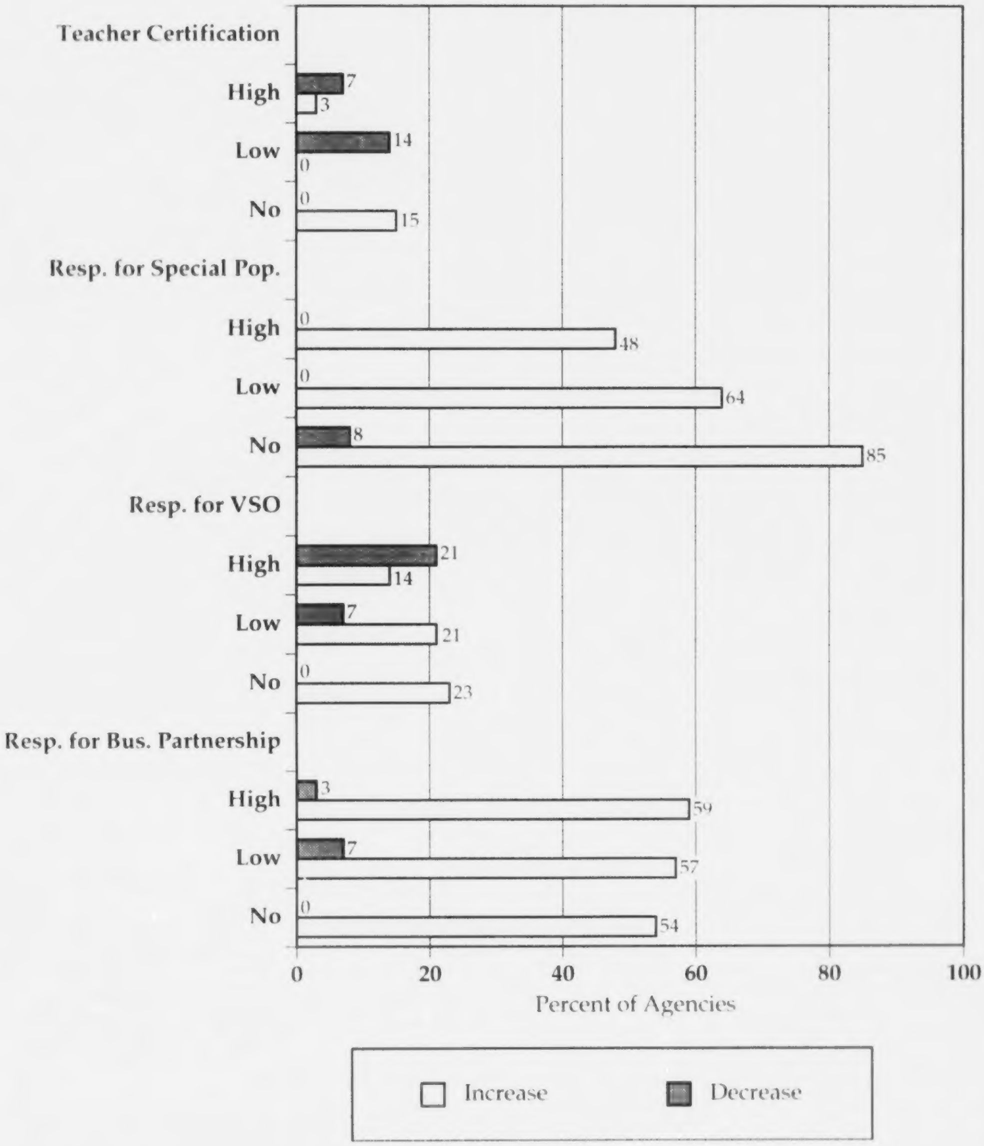
Figure A-3.1 (continued)
Changes in Responsibilities at Secondary State Agencies, by Level of Staff Reduction



High — Offices with staff reduction of 15 percent or more
Low — Offices with staff reduction of less than 15 percent
No — Offices with no staff reduction or an increase

(continued)

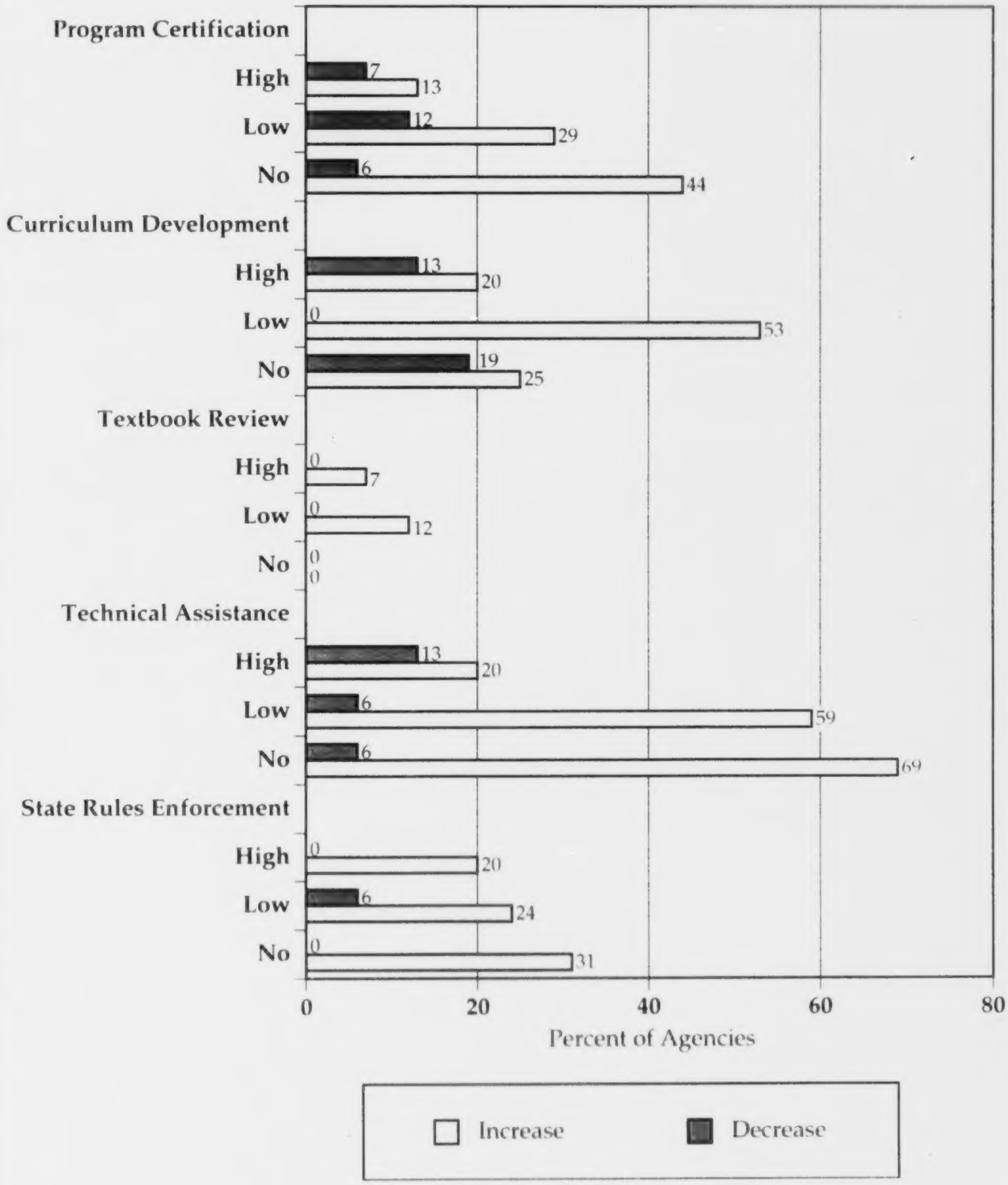
Figure A-3.1 (continued)
Changes in Responsibilities at Secondary State Agencies, by Level of Staff Reduction



High — Offices with staff reduction of 15 percent or more
Low — Offices with staff reduction of less than 15 percent
No — Offices with no staff reduction or an increase

Source: Omnibus Survey of Secondary State Agencies

Figure A-3.2
Changes in Responsibilities at State Postsecondary Agencies, by Level of Staff Reduction



High — Offices with staff reduction of 15 percent or more
Low — Offices with staff reduction of less than 15 percent
No — Offices with no staff reduction or an increase

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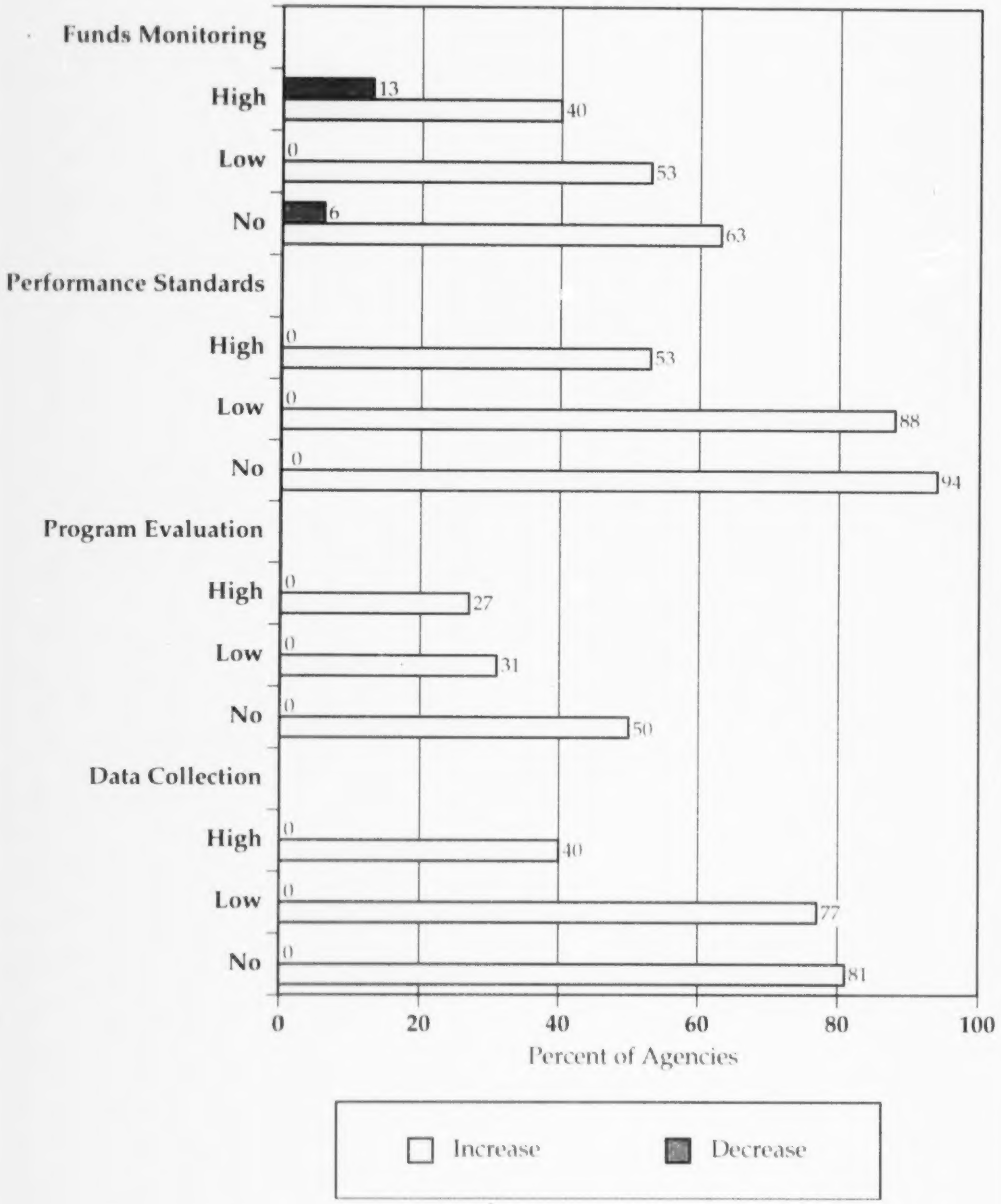
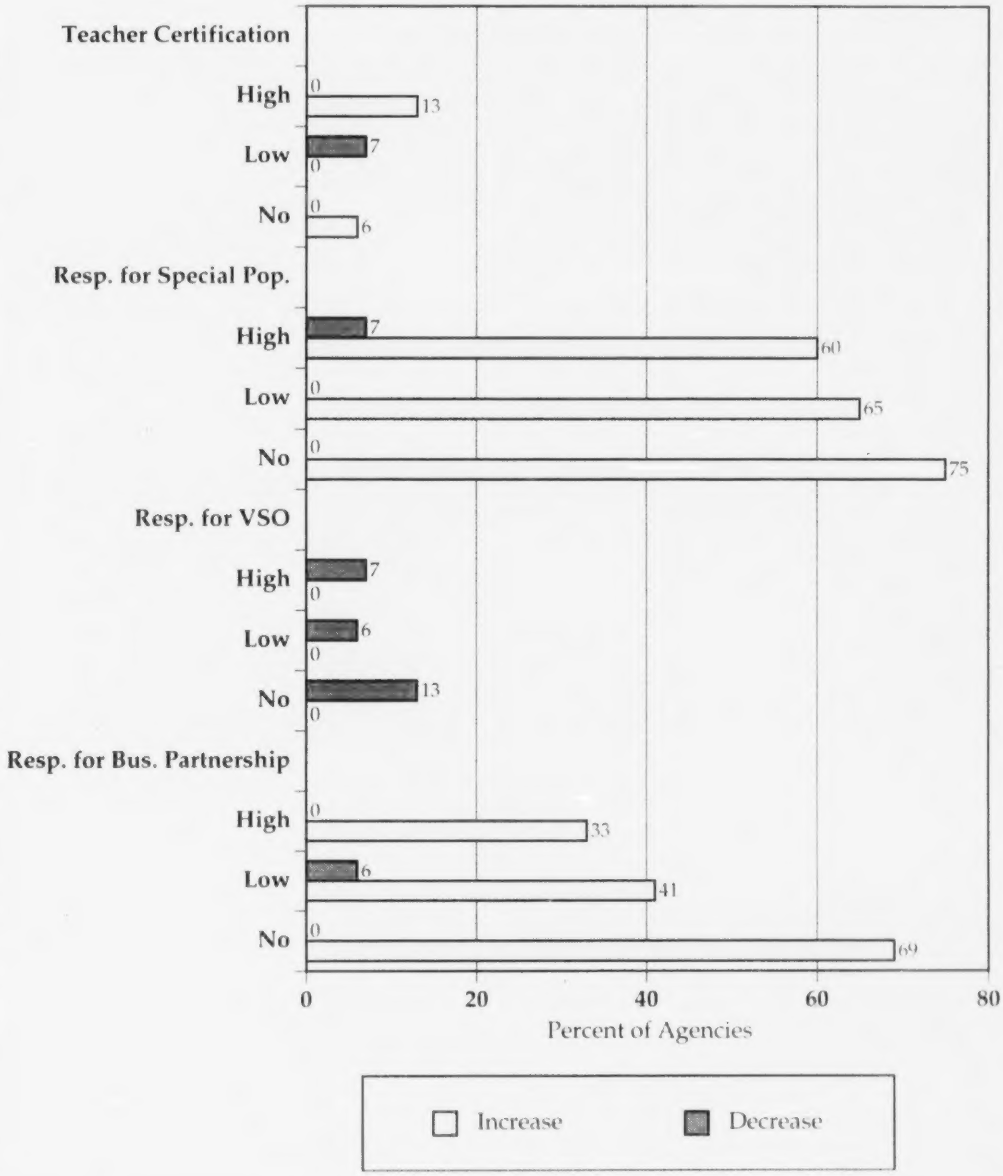
Figure A-3.2 (continued)
Changes in Responsibilities at State Postsecondary Agencies, by Level of Staff Reduction



High — Offices with staff reduction of 15 percent or more
Low — Offices with staff reduction of less than 15 percent
No — Offices with no staff reduction or an increase

(continued)

Figure A-3.2 (continued)
Changes in Responsibilities at State Postsecondary Agencies, by Level of Staff Reduction



High — Offices with staff reduction of 15 percent or more
Low — Offices with staff reduction of less than 15 percent
No — Offices with no staff reduction or an increase

Source: Omnibus Survey of Postsecondary State Agencies

Table A-3.5
Differences (Percent) Between States Reporting Increases and Decreases in Responsibilities by Type of Activity, 1991–92

	Secondary Office			Postsecondary Office		
Activity	High Reduction	Low Reduction	No Reduction	High Reduction	Low Reduction	No Reduction
Program certification	10	13	31	6	17	38
Curriculum development	-11	28	54	7	53	6
Textbook review	-3	-7	7	7	12	0
Technical assistance	18	72	61	7	53	63
State rule enforcement	-7	0	15	20	18	31
Fund monitoring	35	71	69	27	53	57
Performance standard	73	86	77	53	88	94
Program evaluation	-27	-8	46	27	31	50
Data collection	21	36	69	40	77	81
Teacher certification	-4	-14	15	13	-7	6
Special populations	48	64	77	53	65	75
VSO	-7	14	23	-7	-6	-13
Business partnership	56	50	54	33	41	69

Source: Omnibus Surveys of Secondary and Postsecondary State Agencies

Table A-3.6
Opinions of State Secondary Vocational Education Directors on the U.S. Department of Education's Assistance in Implementing the 1990 Perkins Act (Percent Distribution)

In General, the U.S. Department of Education Has:	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
Provided adequate opportunity for input in developing regulations for the 1990 Perkins Act	16	57	9	14	4
Been responsive to inquiries about regulations for the Perkins Act	14	41	11	20	14
Provided Perkins Act information necessary for developing your state plan	14	36	11	30	9
Been responsive to inquiries related to your state plan	16	42	15	11	16
Been timely in handling your state plan after it was submitted	16	20	16	16	31
Provided relevant and timely technical assistance on implementing new initiatives in the Act	4	20	14	36	27

Source: Omnibus Survey of Secondary State Agencies

Table A-3.7
Opinions of State Postsecondary Vocational Education Directors on the U.S. Department of Education's Assistance in Implementing the 1990 Perkins Act (Percent Distribution)

In General, the U.S. Department of Education Has:	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
Provided adequate opportunity for input in developing regulations for the 1990 Perkins Act	17	68	11	4	0
Been responsive to inquiries about regulations for the Perkins Act	11	43	21	13	12
Provided Perkins Act information necessary for developing your state plan	17	36	23	15	9
Been responsive to inquiries related to your state plan	13	49	21	6	11
Been timely in handling your state plan after it was submitted	15	23	15	30	17
Provided relevant and timely technical assistance on implementing new initiatives in the Act	4	23	19	36	17

Source: Omnibus Survey of Postsecondary State Agencies

CHAPTER 4 APPENDIX

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Table A-4.1
Percent of Regular Districts that Provide Access to (1) Vocational Schools (AVS or Vocational High School) and to (2) AVS, 1991–92

	Percent of Districts with Access to Vocational Schools	Percent of Districts with Access to AVS
District Locale		
Rural	55	53
Suburban	80	79
Urban	68	66
Concentration of Special Population Students[a]		
Low	75	75
Medium-low	68	68
Medium-high	58	57
High	52	50

AVS = area vocational school

[a] Grade 9-12 student body that are disabled, economically disadvantaged, or limited English proficient was divided into quartiles as follows: low = 0-25%; medium-low = 26-50%; medium-high = 51-75%; high = 76-100%.

Source: Omnibus Surveys of Regular Districts, Versions A and B

Table A-4.2
Mean Enrollment Change Scores, 1987–88 to 1991–92, By District Type (Regular Districts Only) [a]

	Mean Change for Enrollment of:			
	Vocational Students	Disabled Vocational Students	Disadvantaged Vocational Students	LEP Vocational Students
District special population concentration:				
Lowest 25%	**2.80**	3.11	**3.21**	3.07
Highest 25%	**3.02**	3.17	**3.38**	3.14
District locale:				
Rural	2.97	**3.13**	**3.28**	**3.06**
Suburban	2.79	**3.17**	**3.34**	**3.22**
Urban	2.79	**3.37**	**3.55**	**3.37**
District funding status:				
Received 1984 Perkins funds	2.92	**3.22**	**3.39**	**3.17**
Did not receive funds	2.81	**3.11**	**3.22**	**3.11**

[a] Means in bold are significantly different from other means in the subcolumn at p<.05 using t-tests with uncorrected standard errors. For district locale, the t-tests compare rural and suburban districts to urban districts. Enrollment change scores are explained in Table 4.2 in the text.

Source: Omnibus Surveys of Regular Districts, Versions A and B

Table A-4.3
Percent of Districts With Increase in Graduation Requirements, and Mean Change in Credits, 1982–86 and 1987–92, By Subject Area

	Percent of Districts With Increase [a]		Mean Change In Credits	
Academic Subject Area	1982–87	1987–92	1982–87	1987–92
English	13	9	.13	.12
Math and Science [b]	52	25	.47	.32
Social Studies	39	17	.37	.18

[a] No more than 2% of districts reported a decrease in requirements in either time period for any subject.

[b] Mathematics and science requirements were collected separately for 1982–87, but jointly for 1987–92. These requirements are thus not entirely comparable. The **percentage of districts** with math/science requirement increases in 1982–87 understates the true increase, since the reported percentage is for districts with an increase in math (the higher of the two over that period). The 1982–87 **mean change** in math and science is the average of the change reported for the two subject areas.

Source: Swartz, J.P. (1989), and Omnibus Surveys of Regular Districts, Versions A and B

Table A-4.4
Percent of "Vocational" Students Who are Concentrators and Specialists, and Average Ratio of First-Level to Upper-Level Specific Labor Market Courses, By Student Type, 1990

Student Type	Percent of Concentrators[a]	Percent of Specialists[b]	Average Ratio[c]
All Students	70	29	3.5
Sex			
Males	70	29	3.6
Females	68	27	3.3
Race/Ethnicity			
White	68	28	3.4
Hispanic	70	27	3.6
Black	66	30	3.4
Asian	59	8	4.0
Native American	72	32	3.6
GPA			
Mostly As	65	25	4.4
Mostly Bs	69	30	3.7
Mostly Cs	70	31	3.2
Mostly below C	69	29	2.8
Disability Status			
Disabled	71	24	2.2
Not disabled	68	29	3.5

[a] Percent of all students earning at least three credits in specific labor market preparation courses who also earn at least three credits within one labor market area (e.g., in health).

[b] Percent of all students earning at least four credits in specific labor market preparation courses who also earn at least four credits within one labor market area, with at least two of those credits above the introductory level.

[c] Ratio of first-level specific labor market preparation courses to second-or-higher level courses.

Source: 1990 NAEP

Table A-4.5
Changes in Average Number of Vocational Education Credits and in Percent of Total Credits in Vocational Education, 1982 to 1990, By Student Type

Student Type	Average Number of Vocational Credits				Percent of Total Credits in Vocational Education			
	1982	1987	1990	Percent Change 82–90	1982	1987	1990	Percent Change 82–90
All Students	4.64	4.43	4.10	-12	22	19	17	-23
Sex								
Male	4.62	4.52	4.23	-8	22	20	18	-18
Female	4.66	4.36	3.98	-15	22	19	17	-23
Race/Ethnicity								
White	4.54	4.52	4.13	-9	21	20	18	-14
Hispanic	5.27	4.29	4.00	-24	25	19	17	-32
Black	4.83	4.47	4.36	-10	23	20	19	-17
Asian	3.14	2.92	2.89	-8	14	12	12	-14
Native American	5.11	4.70	4.43	-13	24	20	20	-17
GPA								
Mostly As	3.23	2.90	2.59	-20	14	12	11	-21
Mostly Bs	4.39	4.10	3.69	-16	20	17	15	-25
Mostly Cs	5.26	5.02	4.85	-8	25	23	21	-16
Mostly below C	4.96	5.08	5.00	+1	25	25	23	-8
Disability Status								
Disabled	4.81	5.99	5.99	+25	23	27	26	+13
Not disabled	4.62	4.37	4.05	-12	22	19	17	-23

Source: 1982 HSB, 1987 NAEP, and 1990 NAEP

Table A-4.6
Percent of Students of Each Type in Advanced Academic, Vocational, and General Tracks, 1990

Student Type	Advanced Academic	Vocational	General
Sex			
Male	28	32	43
Female	31	23	48
Race/Ethnicity			
White	10	34	59
Hispanic	40	16	47
Black	23	27	53
Asian	23	28	52
Native American	32	28	43
GPA			
Mostly As	62	13	29
Mostly Bs	39	24	41
Mostly Cs	13	35	53
Mostly below C	2	35	63
Disability Status			
Disabled	3	42	55
Not disabled	30	27	45

Source: 1990 NAEP

Table A-4.7
Average Number of Credits Earned in Different Academic Subject Areas, By Vocational, General, and Academic Track Students, 1982, 1987, and 1990

	1982	1987	1990
English Credits Earned By:			
Vocational students	3.70	3.86	3.92
General students	3.89	3.99	4.31
Advanced academic students	4.36	4.31	4.34
Mathematics Credits Earned By:			
Vocational students	2.10	2.55	2.79
General students	2.60	2.96	3.06
Advanced academic students	3.87	3.99	3.85
Science Credits Earned By:			
Vocational students	1.71	2.01	2.26
General students	2.17	2.36	2.52
Advanced academic students	3.80	3.81	3.64
Social Studies Credits Earned By:			
Vocational students	3.00	3.05	3.21
General students	3.24	3.39	3.60
Advanced academic students	3.28	3.56	3.59
Computer Science Credits Earned By:			
Vocational students	0.08	0.34	0.39
General students	0.07	0.25	0.28
Advanced academic students	0.12	0.43	0.45
Advanced Math[a] Credits Earned By:			
Vocational students	1.06	1.38	1.44
General students	1.67	1.89	1.91
Advanced academic students	3.47	3.67	3.49
Advanced Science[b] Credits Earned By:			
Vocational students	0.31	0.63	0.49
General students	0.69	0.68	0.72
Advanced academic students	2.23	2.27	1.98

[a] Mathematics above Algebra 1.

[b] Science other than survey science and regular biology.

Source: 1982 HSB, 1987 NAEP, and 1990 NAEP

CHAPTER 5 APPENDIX

Table A-5.1
Total Number and Percent of Postsecondary Institutions and Students By Institution Type, 1989–90 School Year

	Institutions		Students	
Type of Institution	Number	Percent	Number (1,000s)	Percent
Private proprietary	5,333	69	1,391	9
Public voc-tec	282	4	231	1
Private two-year	756	10	268	2
Public two-year	1,088	14	6,821	42
Private four-year[a]			2,297	14
Public four-year[a]	282	4	5,260	32
Total	7,774	100	16,271	100

[a] Number and percent of four-year institutions are for public and private four-year institutions combined.

Source: Tuma (1993) and Hoachlander et al. (1992)

Table A-5.2

Percent of Students Enrolled in Vocational, Academic Non-BA, and BA/BS Programs, and Number and Percent of Postsecondary Vocational Students by Institution Type, 1989–90 School Year

	Percent Who Are:			Vocational Students	
Type of Institution	Vocational	Academic Non-BA	BA/BS	Number (1000s)	Percent
Private proprietary	100	0	0	1,391	22
Public voc-tec	100	0	0	231	4
Private two-year	68	32	0	182	3
Public two-year	59	41	0	4,054	66
Private four-year	5	4	91	114	2
Public four-year	4	3	93	210	3
Total	35	19	45	6,173	100

Source: Tuma (1993)

Table A-5.3
Percent of Postsecondary Students in Each Age Range, Overall and by Program Type, 1989–90 School Year

	Less than 20 years old	20 to 23	24 to 29	30 or More
All students	36	22	17	26
Vocational students	29	17	21	33
Academic non-BA students	33	17	17	33
BA students	43	29	14	14

Source: 1989 NPSAS

Table A-5.4
Percent Change in Postsecondary Enrollments and in Population Aged 18–34, By Race/Ethnicity, 1980–88

	Postsecondary Enrollments	Population Aged 18–34
White	4.6	-2.0
Black	2.1	9.9
Hispanic	44.2	47.6
Asian	73.4	64.1
Native American	10.3	22.6

Source: U.S. Bureau of the Census (1991); U.S. Bureau of the Census (1993)

Table A-5.5
Percent of Enrollments in Each Major That Are Male, by Vocational and Academic Discipline, Fall 1986 and Fall 1989

	1986	1989
Vocational Majors		
Health sciences	14.7	17.8
Business support	8.7	20.6
Consumer services	8.6	21.3
Home economics	5.0	23.2
Allied health	19.7	30.5
Vocational home economics	27.4	31.3
Agricultural sciences	53.3	37.7
Marketing	40.0	41.1
Business management	45.5	49.2
Computer science	51.2	54.8
Science technology	51.7	63.2
Natural resources	83.0	64.8
Protective services	66.5	67.8
Communications technician	64.3	69.3
Agriculture	64.8	74.3
Engineering	86.8	84.9
Transportation	89.1	85.9
Precision production	74.4	87.0
Mechanics	93.8	88.7
Engineering technician	88.7	89.4
Construction	91.2	96.6

continued

Table A-5.5 (continued)
Percent of Enrollments in Each Major That Are Male, by Vocational and Academic Discipline, Fall 1986 and Fall 1989

	1986	1989
Academic Majors		
Law/legal assistant	32.1	17.2
Education	25.8	18.8
Public affairs	17.8	21.9
Psychology	26.5	26.2
Foreign language	21.5	29.1
Area/ethnic studies	46.3	31.0
Letters	31.7	35.0
General studies	41.7	41.2
Fine arts	40.6	42.2
Military science	61.2	47.3
Communications	49.1	48.4
Theology	64.7	51.3
Life sciences	49.3	51.8
Parks/recreation	—	53.2
Environmental design	57.0	55.2
Mathematics	50.1	55.6
Social sciences	51.2	59.6
Physical science	71.1	67.4
Philosophy/religion	68.4	81.1

— Too few cases to estimate.

Source: Tuma (1993)

CHAPTER 6 APPENDIX

Table A-6.1
Percent (and Number) of States Reporting Perkins Planning Roles of State Officials Responsible for Part B of IDEA, Chapter 1, and LEP Programs

	Official Responsible For:		
Activity	Part B IDEA	Chapter 1	LEP Student Programs
Review applications submitted by eligible recipients[a]	88 (43) 86 (43)	83 (43) 83 (44)	86 (43) 83 (43)
Develop state plan for Perkins Act	68 (34)	60 (32)	63 (33)
Review and approve state plan for Perkins Act	70 (35)	62 (33)	65 (34)
Attend regularly scheduled, continuing meetings with state vocational education officials	62 (31)	45 (24)	50 (26)
Disseminate materials to local vocational education programs on addressing needs of special group	54 (27)	26 (14)	38 (20)
Monitor local vocational programs	50 (25)	30 (16)	38 (20)
Certify local programs for appropriateness for special group	32 (16)	25 (13)	23 (12)
Other	10 (5)	8 (4)	8 (4)
None of the above[b]	0 (0)	4 (2)	4 (2)
Number responding	50	53	52

[a] First line is for 52 states that are mandated to have this input from these individuals; remaining lines are for all states (total number responding for first line: 49, 52, 50).

[b] The same two states report no input for Chapter 1 and LEP student representatives.

Source: Omnibus Secondary State Survey

Table A-6.2
Percent (and Number) of States Reporting Levels of Group Involvement in Developing the State System of Secondary Performance Standards and Measures

Possible Contributors	Not Consulted	Consulted 1-2 Times	Consulted Regularly or Played Major Role
State vocational education officials	0 (0)	0 (0)	100 (52)
Local vocational education administrators or staff	0 (0)	10 (5)	90 (47)
School administrators	0 (0)	17 (9)	85 (44)
Special population group representatives	2 (1)	15 (8)	83 (43)
Employer representatives	8 (4)	23 (12)	70 (37)
Parents	8 (4)	50 (26)	43 (23)
Students	15 (8)	45 (24)	39 (21)
Union representatives	29 (15)	35 (18)	37 (19)
State legislators or staff	57 (30)	21 (11)	22 (12)

Source: Omnibus Secondary State Survey

Table A-6.3
Percent (and Number) of States Helping Secondary Vocational Programs Provide Equal Access to Quality Vocational Education for Members of Special Populations

Type of Assistance	Before 1991-92	In 1991-92	Planned In 1992-93
Provide districts with guidelines for determining whether special population students have equal access to vocational programs	70 (39)	67 (37)	83 (44)
Establish systematic procedure to monitor vocational education of special population students to ensure equal access and quality instruction	73 (40)	74 (40)	89 (47)
Provide districts with documents or procedures to inform parents of special population students about opportunities in vocational education	55 (29)	52 (27)	69 (35)
Other assistance	9 (4)	10 (4)	9 (4)
Any of the above	81 (44)	77 (40)	90 (47)

Source: Omnibus Secondary State Survey

Table A-6.4
Percent (and Number) of States Reporting Levels of Group Involvement in Developing the State System of Postsecondary Performance Standards and Measures

Possible Contributors	Not Consulted	Consulted 1-2 Times	Consulted Regularly or Played Major Role
State vocational education officials	0 (0)	0 (0)	100 (46)
Vocational faculty or administrators	2 (1)	9 (4)	89 (40)
Special population group representatives	7 (3)	17 (8)	76 (35)
Employer representatives	27 (12)	36 (16)	38 (17)
Parents	36 (16)	31 (14)	33 (15)
Students	33 (15)	36 (16)	31 (14)
Union representatives	49 (22)	31 (14)	20 (9)
State legislators or staff	62 (28)	16 (7)	23 (10)

Source: Omnibus Postsecondary State Survey

Table A-6.5
Percent (and Number) of States Helping Postsecondary Vocational Programs Provide Equal Access to Quality Vocational Education for Members of Special Populations

Type of Assistance	Before 1991-92	In 1991-92	Planned In 1992-93
Issue written information to institutions indicating methods to determine whether special population students have equal access to vocational programs	53 (24)	53 (23)	78 (35)
Establish systematic procedure to monitor vocational education of special population students to ensure equal access and quality instruction	52 (24)	62 (28)	80 (37)
Other assistance	2 (1)	2 (1)	2 (1)
Any of the above	62 (28)	67 (29)	84 (38)

Source: Omnibus Postsecondary State Survey

Table A-6.6
Omnibus Survey Lists of Supplemental Services for Special Population Students

Lists of supplemental services were based on the service lists used in the previous National Assessment. On the postsecondary survey, services for educationally disadvantaged and economically disadvantaged students were combined into a single category of services for disadvantaged students. Services preceded by "S" were included only on the secondary district survey; all other services were included on both the secondary and postsecondary surveys.

Services for Disabled Students

Assessment of vocational interests, abilities, and special needs
Modified or adapted curriculum
Adapted or simplified equipment
Modified facilities
Guidance, counseling, and career development activities
Guidance and counseling on transition to further education or employment
Paraprofessionals or aides in regular vocational classes
Separate vocational classes for disabled students
Job placement services
Tutoring or other individual attention
Other (write-in)

Services for Educationally Disadvantaged Students

Assessment of vocational interests, abilities, and special needs
Remedial basic skills instruction in vocational classes
Remedial basic skills instruction in other classes
S Enrollment in a vocationally oriented school-within-a-school or alternative school
A modified vocational curriculum (e.g., simplified language in technical manuals)
Guidance, counseling, and career development activities
Guidance and counseling on transition to further education or employment
S Paraprofessionals or aides in regular vocational classes
S Separate vocational classes
S Recruitment of out-of-school youth
Employability and/or job placement activities
Tutoring or other individual attention
Other (write-in)

(continued)

Table A-6.6 (continued)
Omnibus Survey Lists of Supplemental Services for Special Population Students

Services for Economically Disadvantaged Students

	Assessment of vocational interests, abilities, and special needs
S	A summer job combined with vocational education
	Paid employment through a school-coordinated program (e.g., cooperative vocational education)
	A stipend or subsidized employment in conjunction with vocational education (e.g., work-study program)
S	Modification of curriculum to accommodate a job during school hours
	Guidance, counseling, and career development activities
	Guidance and counseling on transition to further education or employment
	Employability and/or job search activities
	Child care activities
	Other (write-in)

Services for Limited English Proficient (LEP) Students

Vocational tutoring or assistance by native speaker outside of regular class
Assessment of vocational interests, abilities, and special needs
Modified vocational curriculum (e.g., technical manuals in native language)
Guidance, counseling, and career development activities
Guidance and counseling on transition to further education or employment
Bilingual basic skills instruction
Bilingual vocational instruction
Paraprofessionals or aides in regular vocational classes
Job placement services
Other (write-in)

Table A-6.7
Percent of Districts and Postsecondary Institutions Expanding Each Service From 1990–91 to 1991–92, By 1991–92 Perkins Funding Status

	Secondary Districts		Postsecondary Institutions	
	Funded	Unfunded	Funded	Unfunded
Disabled Student Services				
Assessment of vocational interests, abilities, and special needs	31	22	35	33
Modified or adapted curriculum	26	30	23	19
Adapted or simplified equipment	17	12	34	26
Modified facilities	13	10	30	25
Guidance, counseling, and career development activities	36	13	47	36
Guidance and counseling on transition to further education or employment	36	19	40	38
Paraprofessionals or aides	14	7	27	16
Separate vocational classes	8	4	3	3
Job placement services	23	16	28	22
Tutoring or other individual attention	23	16	49	44

(continued)

Table A-6.7 (continued)
Percent of Districts and Postsecondary Institutions Expanding Each Service From 1990–91 to 1991–92, By 1991–92 Perkins Funding Status

	Secondary Districts		Postsecondary Institutions	
	Funded	Unfunded	Funded	Unfunded
Educationally Disadvantaged Student Services				
Assessment of vocational interests, abilities, and special needs	30	19	39	29
Remedial basic skills instruction in vocational classes	24	11	31	28
Remedial basic skills instruction in other classes	20	19	41	32
Enrollment in a vocationally-oriented school-within-a-school or alternative school	11	8	NA	NA
A modified vocational curriculum	15	12	12	9
Guidance, counseling, and career development activities	36	25	49	34
Guidance and counseling on transition to further employment	35	25	43	29
Paraprofessionals or aides	12	9	22	12
Separate vocational classes	5	9	NA	NA
Recruitment of out-of-school youth	10	5	NA	NA
Employability and/or job placement activities	23	12	39	25
Tutoring or other individual attention	21	16	52	40

(continued)

Table A-6.7 (continued)
Percent of Districts and Postsecondary Institutions Expanding Each Service From 1990–91 to 1991–92, By 1991–92 Perkins Funding Status

	Secondary Districts		Postsecondary Institutions	
	Funded	Unfunded	Funded	Unfunded
Economically Disadvantaged Student Services				
Assessment of vocational interests, abilities, and special needs	27	17	NA	NA
A summer job combined with vocational education	10	11	NA	NA
Paid employment through a school-coordinated program	13	12	13	11
A stipend or subsidized employment in conjunction with vocational education	8	8	6	7
Modification of curriculum to accomodate a job during school hours	13	13	NA	NA
Guidance, counseling, and career development activities	33	21	NA	NA
Guidance and counseling on transition to further education or employment	31	20	NA	NA
Employability and/or job placement activities	25	18	39	25
Child care services	9	7	23	16

(continued)

Table A-6.7 (continued)
Percent of Districts and Postsecondary Institutions Expanding Each Service From 1990–91 to 1991–92, By 1991–92 Perkins Funding Status

	Secondary Districts		Postsecondary Institutions	
	Funded	Unfunded	Funded	Unfunded
Limited English Proficient Student Services				
Vocational tutoring or assistance by native speaker outside class	19	7	23	20
Assessment of vocational interests, abilities, and special needs	29	16	27	16
Modified vocational curriculum	11	<1	10	6
Guidance, counseling, and career development activities	32	20	34	27
Guidance and counseling on transition to further education or employment	29	20	31	21
Bilingual basic skills instruction	20	4	19	18
Bilingual vocational instruction	13	<1	9	5
Paraprofessionals or aides	12	1	18	11
Job placement services	19	12	24	13

NOTE: Disadvantaged student data for postsecondary institutions are for educationally and/or economically disadvantaged students combined.

Source: Omnibus District Survey, Version A, and Postsecondary Institution Survey

CHAPTER 7 APPENDIX

Table A-7.1
Regression Equations Correlating Single Parent Funding With District/Institution Size and Proportion of Poor Students [a]

Secondary Level Regression Equations

Regression 1: $R^2 = .0009$ $F(1,358) = .314$, $p = .58$
Dependent Variable: Percent of poor students
Independent Variable(s):
Whether received single parent grant — $b = .024$ $t(1,358) = .561$, $p = .58$

Regression 2: $R^2 = .0078$ $F(1,358) = 2.826$, $p = .09$
Dependent Variable: Number of poor students
Independent Variable(s):
Whether received single parent grant — $b = 553.7$ $t(1,358) = 1.681$, $p = .09$

Regression 3: $R^2 = .4478$ $F(2,93) = 37.716$, $p < .0001$
Dependent Variable: Amount of single parent grant award (for those with award)
Independent Variable(s):
Proportion of poor students — $b = 24,432$ $t(1,93) = 3.122$, $p = .0024$
Total number of students — $b = 1.1284$ $t(1,93) = 8.267$, $p < .0001$

Postsecondary Level Regression Equations

Regression 4: $R^2 = .0032$ $F(1,666) = 2.109$, $p = .15$
Dependent Variable: Percent of poor students
Independent Variable(s):
Whether received single parent grant — $b = -.25$ $t(1,666) = -1.452$, $p = .15$

Regression 5: $R^2 = .0039$ $F(1,358) = 2.579$, $p = .11$
Dependent Variable: Number of poor students
Independent Variable(s):
Whether received single parent grant — $b = 172.4$ $t(1,666) = 1.606$, $p = .11$

Regression 6: $R^2 = .0621$ $F(2,419) = 13.874$, $p = .0001$
Dependent Variable: Amount of single parent grant award (for those with award)
Independent Variable(s):
Proportion of poor students — $b = 5,874$ $t(1,419) = .573$, $p = .57$
Total number of students — $b = 1.5527$ $t(1,419) = 5.148$, $p < .0001$

NOTE: All regressions run only for those districts/institutions that enroll single parents, single pregnant women, or displaced homemakers in vocational education.

[a] Poor students defined at the secondary level as those eligible for federal free or reduced price lunch, and at the postsecondary level as recipients of Pell Grants or Bureau of Indian Affairs Assistance.

Source: Omnibus Surveys, District Version A and Postsecondary Institution

Table A-7.2
Percent of All Regular Districts, Area Vocational Schools, and Postsecondary Institutions That Offered Each Service for Single Parents, Single Pregnant Women, and Displaced Homemakers in 1991–92

Activity or Service	Regular Districts	Area Vocational Schools	Two-year Postsecondary Institutions
Paraprofessionals or aides	8	29	26
Separate vocational classes	6	12	NA
Separate life skills classes	11	27	51
Extended day or evening offerings	8	30	NA
Basic skills instruction in vocational classes	23	55	57
Guidance, counseling, and career development activities	34	67	91
Guidance/counseling on transition to further education or employment	31	66	88
Student recruitment activities	18	54	82
Child care services	10	25	62
Transportation services	14	29	38
Job placement services	19	60	79

Source: Omnibus Surveys, District A, Secondary School, and Postsecondary Institution

Table A-7.3
Percent (and Number) of Administrators Reporting Various Amounts of Time Allocated for Each Perkins-Related Activity

Activity	Too Little Time Allocated	In-Between	Sufficient Time Allocated
Managing 10.5% funds			
Monitoring local programs	40 (21)	44 (23)	15 (8)
Evaluating effectiveness of local programs	37 (19)	53 (27)	10 (5)
Distributing, managing, and monitoring local program funds	14 (7)	52 (26)	34 (17)
Developing annual plan for the use of funds	12 (6)	50 (25)	38 (19)
Needs Assessments			
Reviewing local agencies' plans for meeting training needs of men and women in nontraditional jobs	25 (13)	58 (30)	17 (9)
Reviewing local vocational education programs for sex stereotyping/bias	24 (12)	66 (33)	10 (5)
Reviewing proposed actions on grants, contracts, and State Board policies	41 (21)	41 (21)	18 (9)
Assessing state progress in sex equity	25 (13)	63 (32)	12 (6)
Local Assistance			
Providing technical assistance and advice to local educators	23 (12)	65 (33)	12 (6)
Assisting in program implementation at the local level	36 (18)	56 (28)	8 (4)
Outreach Services			
Disseminating information on programs	20 (10)	63 (32)	18 (9)
Developing outreach programs/activities	25 (13)	53 (27)	22 (11)

Source: National Alliance State Sex Equity Administrator Survey

Table A-7.4
Percent (and Number) of Administrators Who Rate the 1990 Perkins Act as Having Had Various Effects on Their Programs, Spring 1992 and Spring 1993

Provision	Too Early to Tell [a]	No Effect	Negative Effect	Positive Effect
Spring 1992				
Removal of adult set-asides	39 (18)	46 (13)	50 (14)	4 (1)
Required state match for state administration funds	23 (10)	53 (18)	29 (10)	18 (6)
Removal of disadvantaged and handicapped set-asides	38 (18)	38 (11)	41 (12)	21 (6)
Requirement for competitive grants	9 (4)	51 (21)	17 (7)	32 (13)
Emphasis on serving special populations	27 (13)	17 (6)	11 (4)	71 (25)
New roles and responsibilities for Perkins sex equity administrator	26 (12)	18 (6)	9 (3)	73 (25)
Emphasis on preparatory services	23 (11)	19 (7)	3 (1)	78 (28)
Emphasis on vocational and academic integration	42 (20)	11 (3)	4 (1)	86 (24)
Emphasis on tech-prep programs	43 (21)	11 (3)	0 (0)	89 (24)
Implementation of state system of standards and measures	55 (26)	10 (2)	0 (0)	90 (19)
All changes combined	61 (28)	6 (1)	0 (0)	94 (17)
Spring 1993				
Removal of adult set-asides	26 (7)	50 (10)	40 (8)	10 (2)
Required state match for state administration funds	3 (1)	48 (14)	34 (10)	17 (5)
Removal of disadvantaged and handicapped set-asides	18 (5)	30 (7)	52 (12)	17 (4)
Requirement for competitive grants	4 (1)	19 (5)	11 (3)	70 (19)
Emphasis on serving special populations	10 (3)	30 (8)	7 (2)	63 (17)
New roles and responsibilities for Perkins sex equity administrator	10 (3)	15 (4)	12 (3)	73 (19)
Emphasis on preparatory services	17 (5)	24 (6)	12 (3)	64 (16)
Emphasis on vocational and academic integration	20 (10)	12 (3)	0 (0)	88 (21)
Emphasis on tech-prep programs	27 (8)	27 (6)	5 (1)	68 (15)
Implementation of state system of standards and measures	41 (12)	29 (5)	0 (0)	71 (12)
All changes combined	18 (5)	13 (3)	4 (1)	83 (19)

[a] "Too early to tell" percentages are based on the full sample. All other percentages are based on only those who did not think it was "too early to tell."

Source: National Alliance State Sex Equity Administrator Survey and Follow-up

Table A-7.5
Percent (and Number) of Administrators Who Rate the 1990 Perkins Act as Decreasing, Not Changing, or Increasing Each Program Feature, or Who Think It Is Too Early to Make this Judgment, Spring 1992 and Spring 1993

Program	Too Early to Tell [a]	Decrease	About the Same	Increase
Spring 1992				
State technical assistance to localities	6 (3)	16 (7)	30 (13)	54 (24)
State oversight of local programs	15 (7)	5 (2)	44 (17)	51 (20)
Training women for entry into high technology occupations	28 (13)	3 (1)	50 (17)	47 (16)
Responsiveness to sex equity issues at the state level	11 (5)	2 (1)	55 (23)	43 (18)
Enrollments in Perkins-funded programs	25 (12)	3 (1)	60 (21)	37 (13)
Ability to reach students in greatest need of services	25 (12)	2 (1)	60 (21)	37 (13)
Professional development for local personnel	15 (7)	10 (4)	54 (21)	36 (14)
Overall level of local program quality	34 (16)	3 (1)	61 (19)	35 (11)
Community outreach efforts	15 (7)	5 (2)	64 (25)	31 (12)
State curriculum development efforts	26 (12)	12 (4)	62 (21)	26 (9)
Consistency of local program quality	32 (15)	3 (1)	72 (23)	25 (8)
Provision of services most needed by:				
Nontraditional program students	23 (11)	0 (0)	69 (25)	31 (11)
Displaced homemakers	19 (9)	3 (1)	79 (30)	18 (7)
Single parents	19 (9)	5 (2)	71 (27)	24 (9)
Single pregnant women	21 (10)	3 (1)	68 (25)	30 (11)

(continued)

Table A-7.5 (continued)

Percent (and Number) of Administrators Who Rate the 1990 Perkins Act as Decreasing, Not Changing, or Increasing Each Program Feature, or Who Think It Is Too Early to Make this Judgment, Spring 1992 and Spring 1993

Program	Too Early to Tell [a]	Decrease	About the Same	Increase
Spring 1993				
State technical assistance to localities	3 (1)	19 (5)	26 (7)	56 (15)
State oversight of local programs	0 (0)	27 (8)	23 (7)	50 (15)
Training women for entry into high technology occupations	3 (1)	7 (2)	32 (9)	61 (17)
Responsiveness to sex equity issues at the state level	3 (1)	7 (2)	32 (9)	61 (17)
Enrollments in Perkins-funded programs	17 (5)	8 (2)	42 (10)	50 (12)
Ability to reach students in greatest need of services	7 (2)	0 (0)	48 (11)	59 (16)
Professional development for local personnel	4 (1)	15 (4)	22 (6)	63 (17)
Overall level of local program quality	11 (3)	0 (0)	38 (9)	62 (15)
Community outreach efforts	3 (1)	14 (4)	36 (10)	50 (14)
State curriculum development efforts	11 (3)	25 (6)	50 (12)	25 (6)
Consistency of local program quality	11 (3)	8 (2)	33 (8)	58 (14)
Provision of services most needed by:				
Nontraditional program students	7 (2)	0 (0)	30 (8)	70 (19)
Displaced homemakers	3 (1)	3 (1)	38 (11)	59 (17)
Single parents	3 (1)	4 (1)	36 (10)	61 (17)
Single pregnant women	3 (1)	7 (2)	43 (12)	50 (14)

[a] "Too early to tell" percentages are based on the full sample. All other percentages are based on only those who did not think it was "too early to tell."

Source: National Alliance State Sex Equity Administrator Survey and Follow-up

CHAPTER 8 APPENDIX

Table A-8.1
Percent of Secondary Vocational Teachers Feeling "Very Well Prepared" to Teach Listed Subjects

Subject	Major Field of Study				
	Business	Home Economics	T&I	Other	All
Basic algebra	16	17	22	23	19
Math beyond basic algebra	7	2	15	13	10
Writing	37	40	18	28	31
Occupational principles	82	68	80	71	75

Source: National Assessment of Vocational Education Teacher Survey

Table A-8.2
Percent of Secondary Academic Teachers Feeling "Very Well Prepared" to Teach Listed Subjects

Subject	English	Math	Science	Social Science	Foreign Language	All
Basic algebra	2	100	61	8	10	38
Math beyond basic algebra	2	93	35	3	3	30
Writing	89	12	32	46	61	49
Occupational principles	15	11	8	16	11	12

Source: National Assessment of Vocational Education Teacher Survey

CHAPTER 9 APPENDIX

Appendix 9-A

Secretary's Commission on Achieving Necessary Skills
Department of Labor

SCANS SKILLS

The first five skills are **workplace competencies:**

Resources — Knowing how to allocate time, money, materials, space and staff.

Interpersonal skills — Knowing how to work on teams, teach others, serve customers, lead, negotiate, and work well with people from culturally diverse backgrounds.

Information — Knowing how to acquire and evaluate data, organize and maintain files, interpret and communicate, and use computers to process information.

Systems — Understanding social, organizational, and technological systems; knowing how to monitor and correct performance; and knowing how to design or improve systems.

Technology — Knowing how to select equipment and tools, apply technology to specific tasks, and maintain and troubleshoot equipment.

In addition, there are three broad **foundation skills**:

Basic skills — Reading, writing, arithmetic, mathematics, speaking, and listening.

Thinking skills — The ability to learn, to reason, to think creatively, to make decisions, and to solve problems.

Personal qualities — Individual responsibility, self-esteem and self-management, sociability, and integrity.

Table A-9.1
Percent of Classes in Which More Than Ten Percent of Time Is Spent on Specified Subject

	Type of Class										
	Vocational					Academic					
Subject	Business	Home Ec.	T&I	Other	All	English	Math	Science	Social Studies	Language	All
Problems using basic algebra	6	3	20	15	11	0	81	36	2	0	26
Problems using math beyond basic algebra	3	2	7	8	5	0	57	11	2	0	16
Writing assignments	39	53	33	41	40	92	13	59	75	71	62
Biology principles	0	12	3	24	9	0	0	49	2	0	11
Chemistry laws or principles	0	13	8	13	7	0	4	56	1	0	11
Physics laws or principles	0	4	16	25	11	0	12	45	2	0	12
Occupationally related principles	82	80	89	85	82	17	28	17	14	10	18

Source: National Assessment of Vocational Education Teacher Survey

Table A-9.2
Competencies Contributing to Students' Grades
(Percent of Teachers Saying Competency Contributes to a Great Extent)

Competencies Contributing Greatly to Students' Grades	Academic Classes	Vocational Classes		
		All	Comprehensive High Schools	Vocational Schools
Academic Skills				
Basic mathematics skills or concepts	24	24	22	30
Advanced mathematics skills or concepts	12	4	3	9
Basic science knowledge	14	9	7	15
Advanced science knowledge	7	2	2	5
Basic reading skills	60	45	45	47
Advanced reading skills	33	12	12	14
Writing skills	41	18	18	17
SCANS Skills — Workplace Competencies				
Completing work on time	47	45	46	44
Teamwork skills	15	27	26	36
Research/reference skills	12	7	6	11
Understanding of organizational and technical systems	14	27	26	31
Ability to use technology	13	37	38	34
SCANS Skills — Foundation Skills[a]				
Oral communication	34	35	33	44
Creative thinking and problem solving	44	41	40	47
Self-management skills	40	52	51	54
Vocational/Integrated Skills				
Job-specific skills	4	54	51	73
General employability skills	9	53	49	69
Ability to apply academic concepts to occupational tasks	11	47	46	51

[a] Foundation skills also include basic skills in reading, writing, and math.

Source: National Assessment of Vocational Education Teacher Survey

Table A-9.3
Percent of Teachers Reporting Problems for Vocational Education in Their Schools (Rank)

Problem	Academic Teachers	Vocational Teachers		
		All	Comprehensive High Schools	Vocational Schools
Placing problem students into vocational education programs regardless of appropriateness	39 (6)	55 (1)	56 (2)	52 (1)
Status of vocational education in relation to academic subjects	45 (3)	54 (2)	57 (1)	43 (3)
Student motivation	52 (1)	49 (3)	49 (3)	48 (2)
Maintaining vocational enrollments	33 (10)	47 (4)	49 (3)	41 (4)
Coordinating vocational and academic instruction	43 (4)	42 (5)	42 (5)	39 (6)
Student absenteeism	47 (2)	41 (6)	40 (6)	41 (4)
Adequacy of equipment	36 (7)	39 (7)	40 (6)	33 (8)
Time available for working with students other than students with special needs	40 (5)	38 (8)	39 (8)	37 (7)
Access to computers	35 (8)	34 (9)	36 (9)	27 (10)
Teachers' preparation in instructing students with special needs	31 (12)	33 (10)	34 (10)	30 (9)
Support services for students with special needs	24 (14)	30 (11)	32 (11)	23 (12)
Student discipline	34 (9)	27 (12)	27 (13)	26 (11)
Link between vocational curriculum and local labor market	32 (11)	26 (13)	28 (12)	18 (14)
Maintaining high instructional standards	29 (13)	24 (14)	25 (14)	20 (13)

Source: National Assessment of Vocational Education Teacher Survey

CHAPTER 10 APPENDIX

Table A-10.1
Correlations Between Education Reforms and Vocational Enrollments in Regular Districts, 1987–88 Through 1991–92

	Correlation Coefficient	Significance Level p<
Increase in academic credits required for graduation	-.02	.61
Increase in academic credits needed to enter state university	.09	.02
Increase in academic credits needed for teacher certification	.05	.20
Mandate of longer school day	-.06	.07
Mandate of longer school year	.10	.005
Relaxation of state administrative rules for local districts	.00	.93
Elimination of BA in Education in state university system	.00	.99
Implementation of site-based management	.10	.008
Establishment of parental choice plan	-.08	.02
Elimination of the general track	-.05	.19
Requirement of proficiency or other exam for graduation	.06	.09

Source: Omnibus District Survey, Version B

Table A-10.2
Correlations Between Characteristics of Regular Districts and Increases in Vocational Enrollments, 1987–88 Through 1991–92

	Correlation Coefficient	Significance Level p<
District Demographics		
District size	-.09	.01
Urbanicity	-.09	.02
Percent special populations	.09	.03
Increase in total student enrollments	.44	.0001
Perkins Reforms		
Number of steps to integrate	.19	.0001
Number of steps toward tech prep	.06	.17
Number of performance measures	.10	.006
State Support for Reforms		
State support for integrated vocational-academic programs	.24	.0001
State support for "all aspects of the industry" curriculum	.14	.002
State support for tech-prep programs	.09	.03
State support for vocational program assessment and accountability	.19	.0001
State support for guidance on procedures for assuring equal access to vocational services and programs	.15	.0005
State assistance in developing local plan	.12	.006
State leadership in general	.26	.0001
Federal Reform Initiatives		
Perceived effect of 1990 Perkins Act on integration efforts	.10	.03
Perceived effect of National Goals initiative on integration efforts	.13	.005

continued

Table A-10.2 (continued)
Correlations Between Characteristics of Regular Districts and Increases in Vocational Enrollments, 1987–88 Through 1991–92

	Correlation Coefficient	Significance Level p<
Federal Reform Initiatives (continued)		
Perceived effect of America 2000 initiative on tech prep	.20	.0001
Perceived effect of National Goals initiative on tech prep	.19	.0002
Local Program Improvements		
Added general or transferable vocational skills training over 5 years	.16	.0003
Added cooperative education or work experience programs over 5 years	.16	.0002
Added career exploration over 5 years	.21	.0001
Added assessment of vocational interests or abilities over 5 years	.15	.0004
Added student leadership programs (e.g., FFA, DECA) over 5 years	.24	.0001
Added job placement activities over 5 years	.18	.0001
Added state-of-the-art equipment over 5 years	.09	.03
Problems in Vocational Education		
Problem recruiting special needs students to vocational education	-.11	.009
Problem finding funds for vocational classroom support	-.15	.0002
Problem with image of vocational education in business community	-.22	.0001
Problem with image of vocational education among students and parents	-.26	.0001

Source: Omnibus District Survey, Version B

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CHAPTER 11 APPENDIX

Table A-11.1
Steps Toward Developing a System of Measures and Standards at the Secondary Level (Percent of States)

Developmental Steps	Before 1991–92	Done/ Continued 1991–92	Planned/ Continued 1992–93
Select from existing measures	45	64	68
Develop new measures	32	70	89
Assess the quality of measures chosen	29	59	86
Involve local program administrators in choosing measures	46	79	89
Examine existing data to determine performance levels	48	80	91
Establish performance standards	20	75	95
Utilize business/industry standards	32	55	64
Assess student performance using standards	18	32	77
Evaluate vocational programs using standards	41	55	86
Modify programs based on evaluation results	41	54	86

Source: Omnibus Survey of Secondary State Agencies

Table A-11.2
Steps Toward Developing a System of Measures and Standards at the Postsecondary Level (Percent of States)

Developmental Steps	Before 1991–92	Done/ Continued 1991–92	Planned/ Continued 1992–93
Select from existing measures	52	67	73
Develop new measures	33	67	81
Assess the quality of measures chosen	29	58	92
Involve local program administrators in choosing measures	48	79	92
Examine existing data to determine performance levels	52	77	90
Establish performance standards	33	60	85
Utilize business/industry standards	35	48	56
Assess student performance using standards	35	46	85
Evaluate vocational programs using standards	56	67	94
Modify programs based on evaluation results	50	58	85

Source: Omnibus Survey of Postsecondary State Agencies

Table A-11.3
Increases in Vocational Staff Responsibilities Between Spring 1990 and Spring 1992 (Percent of States)

Staff Responsibilities	Secondary Directors	Postsecondary Directors
Local program certification/approval	29	29
Curriculum development or dissemination	39	33
Textbook review/adoption	5	6
Training/technical assistance to localities	54	50
State rules enforcement	14	25
Distribution or monitoring of federal/state funds (including audits)	57	52
Development/measurement of student performance	79	79
Evaluation of local programs	25	35
Other data collection	43	67
Teacher certification	5	6
Responsibilities concerning special populations	61	67
Responsibilities concerning vocational student organizations	18	0
Responsibilities concerning business/labor partnerships	57	48
Other major responsibilities	36	56

Source: Omnibus Surveys of State Agencies

Table A-11.4
Increases in State Support for District Vocational Programs, Practices, and Communications from 1990–91 to 1991–92 (Percent of Districts)

Vocational Activities	Vocational School Districts	Regular School Districts
Local control and flexibility in program development and implementation	33	23
State regulatory assistance	21	22
State assistance with curriculum development	29	31
State assistance with assessment or accountability	30	28
Local program improvement efforts	72	48
Local assessment and accountability efforts	67	38
Interactions with business and industry	69	39
Services for special populations	70	39

Source: Omnibus Surveys of School Districts

Table A-11.5
Increases in State Support for District Vocational Education Activities From 1990–91 to 1991–92 (Percent of Districts)

District Activities	Vocational School Districts	Regular School Districts
Integrated vocational-academic programs	61	44
All aspects of industry curricula	27	25
Tech-prep programs	80	55
Vocation program assessment and accountability	52	40
Equal access to vocational services and programs	47	37
State leadership in general	33	30

Source: Omnibus Surveys of School Districts

Table A-11.6
Locally Sponsored and State-Sponsored In-Service Programs in Vocational School Districts in 1991–92 (Percent of Districts)

Vocational In-Service Topics	Locally Sponsored	State-Sponsored
Integration of vocational and academic education	59	41
All aspects of the industry curriculum	17	10
Tech-prep programs	45	49
School-based work experience programs	21	13
Student assessment/performance evaluation	37	20
Serving vocational special needs students	50	29
Elimination of sex bias in vocational education	39	36

Source: Omnibus Surveys of School Districts

Table A-11.7
Locally Sponsored and State-Sponsored In-Service Programs for Vocational Education Teachers in Regular School Districts in 1991–92
(Percent of Districts)

Vocational In-Service Topics	Locally Sponsored	State-Sponsored
Integration of vocational and academic education	24	31
All aspects of the industry curriculum	5	12
Tech-prep programs	21	30
School-based work experience programs	14	12
Student assessment/performance evaluation	26	17
Serving vocational special needs students	22	23
Elimination of sex bias in vocational education	18	24

Source: Omnibus Surveys of School Districts

Table A-11.8
Uses of Perkins Title II Funds at the Secondary Level in 1991–92
(Percent of Districts)

Uses of 1991–92 Funds	Vocational School Districts	Regular School Districts
Did not receive Title II basic grant funds	10	26
Vocational improvement/expansion at the middle school level	10	13
Hiring vocational coordinators or other specialists	38	13
Hiring vocational teacher aides or paraprofessionals	40	15
Staff development	48	30
Release time for teachers	21	12
Reduced class sizes	3	2
Purchase of curriculum materials, including lab materials	50	33
Purchase of occupationally relevant equipment	47	30
Modifying existing curriculum materials	36	17
Curriculum development	42	25
Services for special population students	68	29
Purchase of computers, software, curricula for learning labs	40	28
Additional career counselors or guidance activities	38	17
Support of local curriculum coordinators or developers	27	10
Establishment or expansion of industry-education partnerships	29	5
Development or expansion of tech-prep programs	26	15
Development or expansion of vocational performance assessment system	28	11
Development of an "all aspects of the industry" curriculum	6	3
Other	8	4

Source: Omnibus Surveys of School Districts

Table A-11.9
Uses of Perkins Title II Funds at the Postsecondary Level in 1991–92
(Percent of Two-Year Public Postsecondary Institutions)

Uses of 1991–92 Funds	Two-Year Public Postsecondary Institutions
Hiring occupational/technical coordinators or other specialists	35
Hiring teaching assistants or paraprofessionals	38
Staff development	47
Release time for faculty	15
Reduced class sizes	2
Purchase of curriculum materials, including lab materials	55
Purchase of occupationally relevant equipment	56
Modification of existing curriculum materials	35
Curriculum development	39
Services for special population students	73
Purchase of computers, software, curricula for learning labs or other remedial programs	50
Additional career counselors or guidance activities	49
Support of local curriculum coordinators or developers responsible for integration	18
Establishment or expansion of industry-education partnerships	18
Development or expansion of tech-prep programs	31
Development or expansion of vocational performance assessment system	19
Development of an "all aspects of the industry" curriculum	5
Other	9

Source: Omnibus Survey of Postsecondary Institutions

Table A-11.10
Steps to Develop Standards and Measures by Level of Academic/Vocational Integration Activities at the State Secondary Level (Percent of States, Overall and by Quartile)

Activities	Before 1991–92	Done/ Continued 1991–92	Planned/ Continued 1992–93
Establish Performance Standards	20	75	95
Integration quartile 1	0	40	93
Integration quartile 2	13	79	87
Integration quartile 3	42	100	100
Integration quartile 4	31	92	100
Assess Student Performance Using Standards	18	32	77
Integration quartile 1	7	7	60
Integration quartile 2	13	20	73
Integration quartile 3	25	54	92
Integration quartile 4	31	54	85
Select From Existing Measures	45	64	68
Integration quartile 1	20	33	58
Integration quartile 2	53	73	77
Integration quartile 3	58	77	85
Integration quartile 4	54	77	83
Develop New Measures	32	70	89
Integration quartile 1	7	33	80
Integration quartile 2	33	73	87
Integration quartile 3	50	77	92
Integration quartile 4	46	100	100

NOTE: States were assigned to quartiles based on the number of different academic-vocational integration activities they reported in the current and previous school year, with Quartile 1 having the lowest number.

Source: Omnibus Survey of Secondary State Agencies

Table A-11.11
Group Involvement in Developing States' Systems of Standards and Measures at Secondary and Postsecondary Levels (Percent of States)

Groups	Not Consulted	Consulted 1–2 Times	Consulted Regularly	Played Major Role
Secondary Level				
State legislators or staff	54	20	13	9
State vocational education officials	0	0	14	79
Employer representatives	7	21	48	18
Union representatives	27	32	25	9
School administrators	0	16	43	36
Local vocational education administrators or staff	0	9	30	54
Special population group representatives	2	14	48	29
Parents	7	46	30	11
Students	14	43	27	11
Postsecondary Level				
State legislators or staff	58	15	15	6
State vocational education officials	0	0	17	73
Employer representatives	25	33	29	6
Union representatives	46	29	17	2
Occupational/technical faculty or administrators	2	8	27	52
Special population group representatives	6	17	44	27
Parents	33	29	27	4
Students	31	33	23	6

NOTE: Rows may not sum to 100% due to rounding.

Source: Omnibus Secondary and Postsecondary State Surveys

Table A-11.12
Legislative Involvement in Developing States' Systems of Standards and Measures at the Secondary and Postsecondary Levels, by Academic/Vocational Integration Activities (Percent of States, Overall and by Quartile)

Groups	Not Consulted	Consulted 1–2 Times	Consulted Regularly	Played Major Role
Secondary contact with state legislators or staff	54	20	13	9
Integration quartile 1	69	15	0	15
Integration quartile 2	60	27	7	7
Integration quartile 3	50	8	33	8
Integration quartile 4	46	31	15	8
Postsecondary contact with state legislators or staff	58	15	15	6
Integration quartile 1	80	10	10	0
Integration quartile 2	73	9	18	0
Integration quartile 3	45	27	9	18
Integration quartile 4	50	17	25	8

NOTE: States were assigned to quartiles based on the number of different academic-vocational integration activities they reported in the current and previous school year, with Quartile 1 having the lowest number.

Source: Omnibus Secondary and Postsecondary State Surveys

Table A-11.13
Use of Outcome Measures at the Secondary Level, Prior to 1991–92, During 1991–92, and Intended in 1992–93 (Percent of States)

Specific Measure	Prior to 1991–92	1991–92	1992–93	Increase
Enrollment				
Program enrollment	70	70	79	9
Special population enrollment	68	75	86	18
Academic Skills				
Basic academic skills	30	41	84	54
Advanced academic skills	14	23	70	56
Occupational Skills				
Occupational skills	46	54	79	33
Employability skills	36	43	66	30
School Completion or Retention				
Course description	32	36	54	22
Program completion	50	54	66	16
Certification rates	20	20	36	16
Graduation rates	34	34	63	29
School retention	30	34	63	33
Job Placement				
Employment	71	75	84	13
Related employment	64	68	73	9
Military service	66	71	79	13
Additional training or education	64	73	80	16
Wages or Job Retention				
Entry wage	30	32	39	9
Job retention	18	20	25	7
Other	7	9	23	16

NOTE: Percentage change in use is the difference between use reported before 1991–92 and intended use in 1992–93.

Source: Omnibus Survey of Secondary State Agencies

Table A-11.14
Use of Outcome Measures at the Postsecondary Level, Prior to 1991–92, During 1991–92, and Intended in 1992–93 (Percent of States)

Specific Measure	Prior to 1991–92	1991–92	1992–93	Increase
Enrollment				
Program enrollment	71	75	79	8
Special population enrollment	54	67	81	27
Academic Skills				
Basic academic skills	25	33	79	54
Advanced academic skills	13	21	67	54
Occupational Skills				
Occupational skills	25	35	73	48
Employability skills	19	25	48	29
School Completion or Retention				
Course description	27	33	63	36
Program completion	50	58	77	27
Certification rates	27	29	33	6
Graduation rates	44	52	63	19
School retention	25	33	48	23
Job Placement				
Employment	67	75	88	21
Related employment	63	67	79	16
Military service	63	67	79	16
Additional training or education	63	69	83	20
Wages or Job Retention				
Entry wage	33	33	50	17
Job retention	21	23	29	8
Other	2	4	6	4

NOTE: Percentage change in use is the difference between use reported before 1991–92 and intended use in 1992–93.

Source: Omnibus Surveys of Postsecondary State Agencies

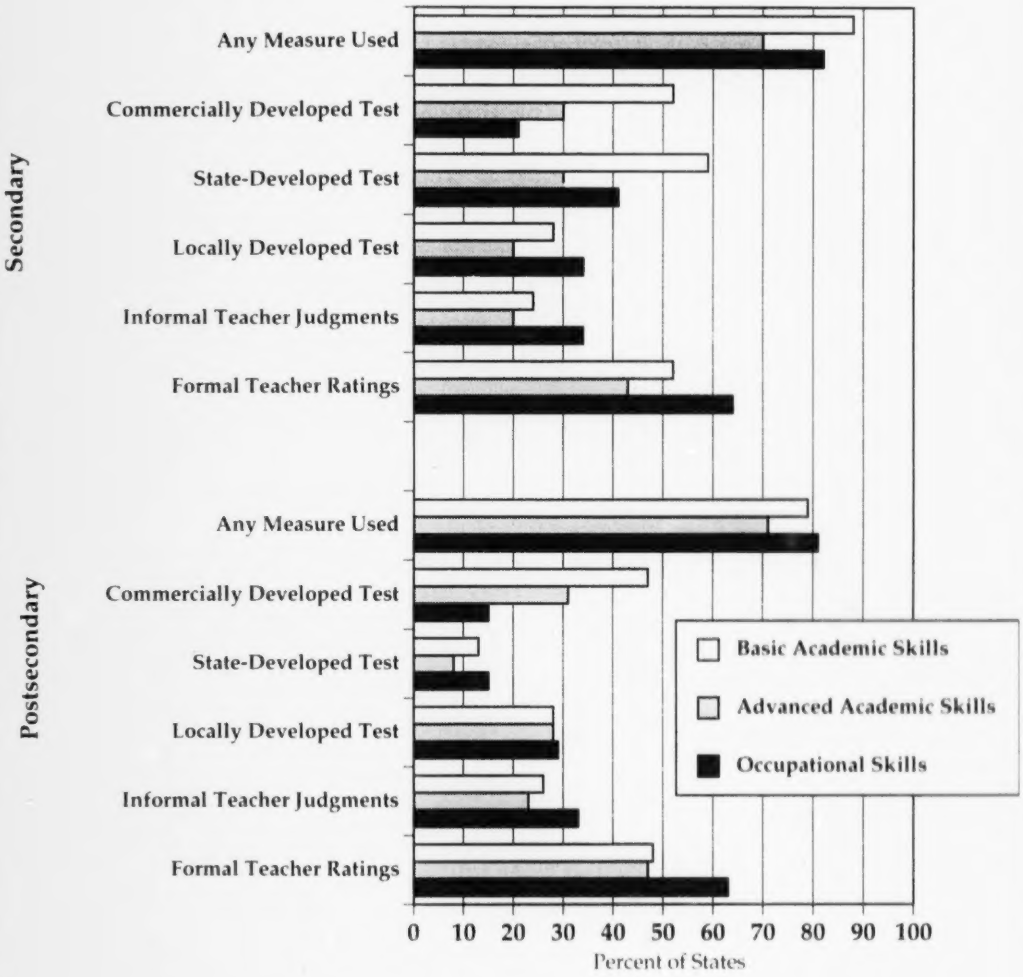
Table A-11.15
Use of Job Placement Measures in Statewide Systems at the Secondary and Postsecondary Levels (Percentage of States)

Measures	Secondary Level	Postsecondary Level
Duration of job seeking	11	6
Earnings/wage levels	41	42
Length of stay in job	21	10
Employer satisfaction	52	50
Employee satisfaction	43	42
Other	11	15

NOTE: For each category, approximately 20% (or more) of state directors were still unsure whether these or other job placement measures will be used as part of their performance measurement systems.

Source: Omnibus Surveys of Secondary and Postsecondary State Agencies

Figure A-11.1
Use of Assessment Tools for Measuring Three Types of Skills



Source: Omnibus Surveys of Secondary and Postsecondary State Agencies

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Table A-11.16
Adjustments to Performance Standards, Prior to 1991–92, During 1991–92, and Intended in 1992–93 (Percent of States)

Adjustment for:	Prior to 1991–92	1991–92	1992–93	Increase
Secondary				
Disabled students	23	36	61	38
Disadvantaged students	18	32	57	39
LEP students	20	32	57	37
Other special populations	4	9	14	10
School resources	18	32	45	27
Local labor market	21	36	52	31
Postsecondary				
Disabled students	17	23	50	33
Disadvantaged students	17	21	48	31
LEP students	15	19	46	31
Other special populations	2	6	8	6
School resources	17	27	33	16
Local labor market	21	31	46	25

NOTE: Percentage increase is the difference between use reported before 1991–92 and intended use in 1992–93.

Source: Omnibus Surveys of Secondary and Postsecondary State Agencies

Table A-11.17
Vocational Districts' Data Collection and Reporting Activities in 1991–92 (Percent of Districts)

Specific Measure	Collect	Report	Difference
Program enrollment	99	99	0
Special population enrollment	98	99	0
Basic academic skills	66	28	38
Advanced academic skills	36	12	24
Occupational skills	89	34	55
Employability skills	74	25	48
Course completion	88	80	7
Program completion	93	86	7
Certification rates	66	46	20
Graduation rates	67	55	12
School retention	69	57	12
Employment	95	84	11
Related employment	93	82	10
Military service	93	81	12
Additional training or education	91	78	13
Entry wage	61	47	14
Job retention	50	38	12

NOTE: The difference is the percentage of districts reporting information subtracted from the percentage collecting the same information.

Source: Omnibus Survey of Vocational Districts

Table A-11.18
Regular Districts' Data Collection and Reporting Activities in 1991–92 (Percent of Districts)

Specific Measure	Collect	Report	Difference
Program enrollment	93	90	3
Special population enrollment	89	86	2
Basic academic skills	67	44	23
Advanced academic skills	48	30	18
Occupational skills	55	29	25
Employability skills	45	23	22
Course completion	72	59	12
Program completion	71	62	10
Certification rates	32	27	5
Graduation rates	77	68	9
School retention	71	61	11
Employment	65	48	17
Related employment	54	42	12
Military service	61	45	16
Additional training or education	62	46	16
Entry wage	29	23	7
Job retention	24	18	6

NOTE: The difference is the percentage of districts reporting information subtracted from the percentage collecting the same information.

Source: Omnibus Survey of Regular Districts

Table A-11.19
Two-Year Postsecondary Institutions' Data Collection and Reporting Activities in 1991–92 (Percent of Institutions)

Specific Measure	Collect	Report	Difference
Program enrollment	96	91	5
Special population enrollment	89	84	5
Basic academic skills	76	32	44
Advanced academic skills	27	11	16
Occupational skills	37	16	21
Employability skills	26	11	15
Course completion	77	48	29
Program completion	83	68	15
Certification rates	76	55	21
Graduation rates	86	71	15
School retention	77	49	28
Employment	86	64	22
Related employment	76	57	19
Military service	52	41	11
Additional training or education	65	48	17
Entry wage	65	45	21
Job retention	30	22	8

NOTE: The difference is the percentage of institutions reporting information subtracted from the percentage collecting the same information.

Source: Omnibus Survey of Postsecondary Institutions

CHAPTER 12 APPENDIX

Appendix 12-A

Some 1980s Reports on Educating for the Workforce

In 1984, the College Board assembled 200 business leaders and educators to discuss academic preparation for work. The conference recommended a more advanced and work-relevant form of the three Rs, and also called for attention to speaking and listening skills and an emphasis on the ability to reason.

In 1987, the National Alliance of Business published *The Fourth R: Workforce Readiness,* which emphasized education in the three Rs, speaking and listening, problem solving, working in organizations, and work ethics.[1]

In 1988, the American Society for Training and Development (ASTD) published a report called *Workplace Basics: The Skills Employers Want.* [2] Like its predecessors, the ASTD report emphasized the three Rs, speaking and listening, and reasoning abilities. In addition, the ASTD report emphasized the need for interpersonal skills, teamwork, and leadership.

Other reports on the subject, including the Labor Department's *Workforce 2000* [3] and the Secretary's Commission on Achieving Necessary Skills (SCANS)[4], emphasized the importance of developing a range of work-related skills that spanned both academic and vocational programs. As a rule, these reports place little, if any, emphasis on specific "hard" skills, such as knowing how to operate a drill press or build a brick wall, and considerable emphasis on the development of thinking skills and the interpersonal skills of the workplace.

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[1] National Alliance of Business (1987). *The Fourth R: Workforce Readiness.* Washington, DC: Author.

[2] Carnevale, A.P. (1988). *Workplace Basics: The Skills Employers Want*. Alexandria, VA: American Society for Training and Development.

[3] Johnston, W.B. (1987). *Workforce 2000: Work and Workers for the 21st Century*. Indianapolis, IN: Hudson Institute.

[4] Secretary's Commission on Achieving Necessary Skills (1991). *What Work Requires of Schools: A SCANS Report for America 2000.* Washington, DC: U.S. Department of Labor.

Appendix 12-B

Models of Postsecondary Integration (from Grubb and Kraskouskas, 1992)

1. **General education requirements.** Many schools require occupational students to enroll in general education courses. While most schools do not modify these classes to suit vocational students' needs, many at least offer guidance as vocational students choose their courses.

2. **Applied academic courses.** These are academic courses that utilize applications in occupational areas and are primarily designed for occupational students. Examples include technical writing, business math, and agricultural economics.

3. **Cross-curricular programs.** These types of programs offer a way for more academic content to be included in occupational programs, by emphasizing both the academic and vocational content. The most common form is Writing Across the Curriculum, but other versions include Communications Across the Curriculum, Humanities Across the Technologies, and Reading Across the Curriculum.

4. **Incorporating academic modules in occupational courses.** At the classroom level, some occupational instructors incorporate academic modules in their occupational curriculum. Instructors might include academic disciplines such as history or ethics in their courses.

5. **Multi-disciplinary courses combining academic perspectives and occupational concerns.** In most cases these courses are designed by academic and occupational faculty working together. Some of the more common themes are the role of work for individuals and society, the history of technology and its effects on society, ethical issues surrounding work and technological change.

6. **Tandem and cluster courses and learning communities.** Such groupings provide a structure for integration since students take complementary courses—both academic and vocational—concurrently. In this model, teachers may reinforce material taught in the related courses, analyze similar issues from various perspectives, utilize common examples and applications, design projects for more than one course, or build on concepts taught in other courses.

7. **Colleges-within-colleges.** These can best be described as expanded clusters. Colleges-within-colleges are rare since most students are either unable or unwilling to commit to an entirely pre-set program.

8. **Remediation and ESL programs with an occupational focus.** These types of programs were developed to address the needs of vocational students requiring academic remediation and ESL instruction. They focus on relatively basic skills, but include introductory material in an occupational area. Like applied courses, they provide an occupational context for vocational students.

Appendix 12-C
Some Initiatives for National Education Reform

The Carl D. Perkins Vocational and Applied Technology Act of 1990 provides grants to state education through secondary, postsecondary, and adult vocational education services. The purpose of the grants is to improve educational programs that lead to academic and occupational skill competencies needed to work in a technologically advanced society.

In 1991, the Labor Secretary's Commission on Achieving Necessary Skills (SCANS)[1] found that work involved five competencies and three foundation skills. The competencies are: resources, interpersonal, information, systems, and technology. The foundation skills are: basic skills, thinking skills, and personal qualities.

America's Choice: High Skills or Low Wages was a 1990 report of the Commission on the Skills of the American Workforce.[2] The Commission emphasized that new high performance forms of work organization have different requirements than manufacturing-based work. Employers must be prepared to invest heavily in training existing workers to compensate for the slowing of work force growth in the 1990s.

America 2000 is a national strategy outlined by President Bush and state governors at the 1989 Education Summit in Charlottesville, Virginia.[3] The strategy emphasizes readiness for school, high school completion, safe schools, educational accountability, life-long learning, and world class performance standards that establish what students need to know in five core subjects. The National Education Goals Reports of 1991 and 1992 are annual report cards describing progress toward the America 2000 goals.[4]

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[1] Secretary's Commission on Achieving Necessary Skills (1991), *What Work Requires of Schools: A SCANS Report for America 2000*, Washington, DC: U.S. Department of Labor.

[2] National Center on Education and the Economy (1990), *America's Choice: High Skills or Low Wages*, the report of the Commission on Skills of the American Workforce, Rochester, NY: Author.

[3] U.S. Department of Education (1991), *America 2000: An Education Strategy*, Washington, DC: Author; U.S. Department of Education (1991), *America 2000: An Education Strategy* (Rev. Ed.), Washington, DC: Author.

[4] National Education Goals Panel (1991), *The National Education Goals Report: Building a Nation of Learners*, Washington, DC: Author; National Education Goals Panel (1992), *The National Education Goals Report 1992*, Washington, DC: Author.

Table A-12.1
Percent of Perkins-Funded and Unfunded Districts Taking Specific Steps to Integrate, 1991–92

Steps Toward Integration	Regular		Vocational	
	Funded	Unfunded	Funded	Unfunded
Hold planning meetings	75	55	91	79
Develop guidance and counseling activities to promote integration	69	59	74	66
Integrate curricula across academic and vocational courses	70	57	87	67
Provide in-service training for vocational teachers on integration	61	48	74	71
Develop sequences of integrated academic and vocational courses	57	45	77	66
Provide in-service training for academic teachers on integration	48	40	65	51
Develop occupational clusters, career paths, or occupational majors	46	33	70	67
Evaluate vocational teachers on instruction in mathematics, reading, and/or writing	27	23	34	32
Develop academies or occupationally oriented schools within schools	22	7	28	20
Develop occupationally oriented magnet high schools	13	1	20	13

Source: Omnibus Surveys of Regular and Vocational Districts

Table A-12.2
Percent of Community Colleges and Postsecondary Vocational Institutions Taking Specific Steps to Integrate Academic and Vocational Education, 1990–91 and 1991–92

Steps Toward Integration	Community College		Postsecondary Vocational	
	1992	1991	1992	1991
Support remedial/developmental education	98	96	91	93
Establish general education competencies for occupational/technical students	84	73	85	78
Hold planning meetings to establish policies or procedures for integration	78	59	73	61
Develop applied academics courses (e.g., Technical Math, Business English)	73	72	74	71
Use cross-curriculum materials (e.g., Writing Across the Curriculum)	70	61	41	34
Provide in-service training for vocational faculty on integration	46	31	46	37
Provide "tandem" courses where students take coordinated vocational and academic courses	43	40	45	43
Provide in-service training for academic faculty on integration	37	24	35	27
Provide interdisciplinary courses combining occupational issues and academic disciplines	35	31	30	26
Use applied academics or other integrated courses from commercial vendors	21	12	30	24

Source: Omnibus Survey of Postsecondary Institutions

Table A-12.3
Percent of Community Colleges and Postsecondary Vocational Institutions Taking Specific Steps to Integrate Academic and Vocational Education, by Funding Status

Steps Toward Integration	Community College		Postsecondary Vocational	
	Funded	Unfunded	Funded	Unfunded
Support remedial/developmental education	98	98	95	89
Establish general educational competencies for occupational/technical students	85	78	85	84
Hold planning meetings to establish policies or procedures for integration	78	78	71	83
Develop applied academics courses (e.g., Technical Math, Business English)	77	73	74	75
Use cross-curriculum materials (e.g., Writing Across the Curriculum)	69	55	39	45
Provide in-service training for vocational faculty on integration	47	41	46	46
Provide "tandem" courses where students take coordinated vocational and academic courses	43	40	46	40
Provide in-service training for academic faculty on integration	38	32	35	35
Provide interdisciplinary courses combining occupational issues and academic disciplines	38	27	27	35
Use applied academics or other integrated courses from commercial vendors	23	13	30	29

Source: Omnibus Survey of Postsecondary Institutions

Table A-12.4
Percent (and Number) of State Agencies Taking Steps to Promote Instruction in All Aspects of the Industry

Actions Taken	Secondary	Post-secondary
Adopt a definition of "all aspects of the industry"	18 (10)	6 (3)
Provide mandatory curriculum frameworks or guidelines for LEAs/schools to assure that "all aspects of the industry" are addressed in vocational courses	14 (8)	13 (6)
Provide recommended curriculum frameworks or guidelines for LEAs/schools to assure that "all aspects of the industry" are addressed in vocational courses	25 (14)	15 (7)
Issue guidelines for local plan on "all aspects of the industry"	25 (14)	—
Provide in-service training for vocational teachers on "all aspects of the industry"	20 (11)	6 (3)
Provide in-service training for guidance counselors on "all aspects of the industry"	14 (8)	4 (2)

Source: Omnibus Surveys of Secondary and Postsecondary State Agencies

Table A-12.5
State Support for All Aspects of the Industry
(Percent of Districts)

Type of District	Support Increased	Very Good Support
All regular districts	24	8
All vocational districts	27	11
Funded regular districts	28	11
Funded vocational districts	27	13
Unfunded regular districts	14	5
Unfunded vocational districts	27	7

Source: Omnibus Surveys of Regular and Vocational Districts

CHAPTER 13 APPENDIX

Table A-13.1
Steps to Implement Tech-Prep Programs in Secondary Districts by 1991–92 (Percent)

Steps Toward Tech-Prep	Regular		Vocational	
	1992	1991	1992	1991
Hold tech-prep meetings with local secondary institution(s)	92	50	97	62
Form consortium with other local educational agencies for tech-prep purposes	81	37	86	40
Provide teacher or counselor training on tech-prep	79	32	71	26
Modify curricula for tech-prep	73	31	80	39
Develop course sequence(s) for tech-prep	70	30	79	36
Develop activities or programs to prepare students for tech-prep option	70	31	75	32
Tech-prep policy adopted by governing board	66	29	67	35
Establish formal tech-prep enrollment procedures	48	21	55	22
Employ a tech-prep coordinator	40	15	44	16
Develop "all aspects of the industry" curriculum for use in tech-prep program	36	13	50	19

Source: Omnibus District Surveys, Version B and Vocational

Table A-13.2
Steps to Develop Tech Prep in Two-Year Postsecondary Institutions
(Percent)

Steps Toward Tech-Prep	Community College		Vocational Institutions	
	1992	1991	1992	1991
Hold tech-prep planning meetings with local school districts and/or schools	98	64	96	65
Develop articulation agreement(s) with local school districts and/or schools	95	74	89	63
Collaboration between secondary and postsecondary instructors to modify course content	84	52	83	43
Grant postsecondary credit for high school courses	77	64	73	47
Establish secondary/postsecondary majors or career paths	76	39	78	37
Tech-prep policy adopted by governing board	72	36	76	43
Establish a non-duplicative sequence of secondary and postsecondary tech-prep courses	72	37	74	34
Provide written publicity about tech-prep program(s) to high school students	67	31	68	27
Joint training of secondary and postsecondary instructors	62	25	67	28
Modify postsecondary curricula for tech prep	60	27	51	21
Employ a tech-prep coordinator	59	23	61	25
Develop "all aspects of the industry" curriculum for use in tech-prep program	41	15	53	22

Source: Omnibus Survey of Postsecondary Institutions

TECHNICAL APPENDIX

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TECHNICAL APPENDIX

This appendix describes the methodology used for the major data collection efforts contributing to this Interim Report. For each effort, we summarize the issues addressed, sampling, data collection procedures, and, where appropriate, survey response rates and statistical reliability. The time period in which all data were collected is also provided.

We first review survey efforts, beginning with the National Assessment's Omnibus Surveys. Other surveys discussed are the National Assessment of Vocational Education Teacher Survey, the National Alliance for Partnerships in Equity's State Sex Equity Administrator Survey, and a series of surveys by the National Center for Education Statistics--the Schools and Staffing Surveys; the 1982, 1987, and 1990 transcript studies, and the National Postsecondary Student Aid Study . We also review the State Finance Record Collection of Perkins funding data. Finally, we review two case study efforts, the Community Case Studies and the Funding Case Studies, both of which were based on Omnibus Survey samples.[1]

Most sections of this Technical Appendix were taken verbatim, or almost verbatim, from the references listed at the end of this appendix. We gratefully acknowledge the work of those authors.

THE OMNIBUS SURVEYS[2]

The Omnibus Surveys were developed by National Assessment staff, with input from the National Center for Research on Vocational Education, to collect information on vocational education conditions and the implementation of the 1990 Perkins Act (see Table A-1.2 in the Chapter Appendix). These surveys consist of seven paper-and-pencil questionnaires:

- Survey of State Directors of Secondary Vocational Education
- Survey of State Directors of Postsecondary Occupational/ Technical Education
- Survey of Public Secondary School Districts (Version A)
- Survey of Public Secondary School Districts (Version B)
- Survey of Public Vocational School Districts
- Survey of Public Secondary Schools
- Survey of Two-year Public Postsecondary Institutions

The respondents for the three district surveys were the district director of vocational education; for the secondary school survey, the school principal (who often forwarded the survey to the school's vocational education department head); and for the postsecondary institution survey, the institution's president (who typically forwarded the survey to the dean for occupational/technical education).

Sample Selection

All eligible respondents were surveyed (that is, we conducted a census survey) for four of the Omnibus Surveys: the two surveys of state directors of vocational education; the survey of vocational districts; and the survey of public two-year postsecondary institutions.

The National Association of State Directors of Vocational and Technical Education provided lists of all secondary and postsecondary state directors for the state director surveys. The lists included 57 secondary and 57 postsecondary state directors, covering the 50 states, the District of Columbia, and the six U.S. territories that receive Perkins funds.

The U.S. Department of Education's Integrated Postsecondary Data System (IPEDS), a universe listing of all such institutions, provided the sampling frame for public two-year postsecondary institutions. The Omnibus postsecondary survey sample included all 992 public two-year postsecondary institutions listed on the IPEDS.

The Quality Education Data (QED) listing of schools and school districts, supplemented by the U.S. Department of Education's Common Core of Data (CCD), provided the sampling frame for selecting public secondary districts and schools. This combination allowed for more complete universe coverage, and provided all variables needed for sample stratification. All 443 vocational districts on the sampling frame were selected for the Omnibus Vocational District Survey.

Schools and regular districts were sampled after first limiting the sample to public districts and schools with 11th and 12th grades, then separating vocational schools from regular schools. Schools were considered to be regular unless they provided only vocational education, and districts were considered regular if at least one school was regular. All 661 schools within the 443 vocational districts were sampled with certainty, and all 469 vocational schools within the sampled regular districts were sampled with certainty, for a total sample of 1,130 of the 1,477 vocational schools in the country.

The 11,263 regular secondary districts were sampled with probability proportionate to a measure of size (based on the aggregate square root of enrollments in grades 11 and 12) within each of three strata: urban, suburban, and rural districts. Because of the small number of regular urban districts, all 465 such districts were sampled with certainty. A sample of 666 districts was selected from the pool of 4,054 suburban districts, and 666 districts were selected from the 6,744 rural districts. The resulting sample was randomly split in half, with half of the districts receiving one questionnaire (Version A), and the other half receiving a (partially) different questionnaire (Version B).

In a second stage, at least one regular high school was selected from each sampled district, with a probability based on the square root of enrollments in grades 11 and 12. Of the 15,421 regular secondary schools, 2,000 were selected, with 668 from urban districts, 666 from suburban districts, and 666 from rural districts.

Data Collection

The surveys were administered from March to October, 1992. Thus, most surveys were completed at the end of the first year of implementation of the 1990 Perkins Act, with very few completed at the beginning of the second year of implementation.

The data collection involved multiple (mass and individual) mail-outs, followed by extensive telephone data retrieval efforts. Final response rates exceeded 70 percent for all surveys except the secondary school survey, which had a response rate of 69 percent (Table A.1). A major reason for this lower response rate for secondary schools was that data retrieval extended into the summer, at which point many school respondents were unreachable.

Table A.1
Response Rates for the Omnibus Surveys

	Percent
Survey of State Directors of Secondary Vocational Education	91
Survey of State Directors of Postsecondary Occupational/ Technical Education	87
Survey of Secondary School Districts, Version A	86
Survey of Secondary School Districts, Version B	84
Survey of Vocational School Districts	71
Survey of Public Secondary Schools	69
Survey of Two-year Public Postsecondary Institutions	79

Source: Chaney (1993)

Weighting and Reliability of Estimates

The census surveys did not require weighting, as all cases were selected with certainty. This includes the two state administrator surveys, the vocational district survey, and the two-year public postsecondary institution survey. The remaining surveys were weighted as described below.

Basic Sampling Weights

The basic sampling weights for regular districts and schools (the only entities needing weighting) were the reciprocals of their overall selection probabilities. Because the sample of regular districts was split in two, with each half receiving a different questionnaire, additional weights were created for estimating national totals for those questions where only a half-sample was available.

Nonresponse Adjustments

The validity of survey estimates depends on the degree to which nonrespondents are systematically different from those who responded. To determine the potential for nonresponse bias, information on the sampling frames was used to determine which classification groups were least likely to respond to the surveys.

For both vocational districts and postsecondary institutions, large districts/institutions were somewhat more likely to respond than those with small enrollments. Since district/institution size is related to Perkins funding, there may be some tendency for unfunded districts and institutions to be under-represented, and for those policies that are associated with Perkins funding to be over-represented in these data.

Vocational districts also had lower response rates (71%) than regular districts (85%). However, given the relatively small number of vocational districts and students in those districts, a higher response rate among vocational districts would have had little effect on the overall totals.

Nonresponse biases on the regular district and school samples were minimized through adjustments to the sampling weights. This adjustment is particularly important when response rates are relatively low, as they were for the school survey (which had a response rate of 69%).

The basic sampling weights were adjusted for nonresponse by dividing the districts into 45 separate classes, based on the level of urbanization (rural, suburban, urban), region, and district size. The basic sampling weights were then multiplied by the ratio of the sum of the basic sampling weights across all districts or schools to the sum of the district or school weights for the responding districts or schools. The questionnaire-specific weights used for items asked only of half-samples of regular districts were similarly adjusted for nonresponse.

Standard Error Estimation

The jackknife replication procedure was used to estimate standard errors for estimates from the regular district and school surveys. In jackknife replication, a specified number of systematic subsamples is generated from the full sample, and these are used to define a series of jackknife replicates by dropping one subsample at a time from the full sample. Each jackknife replicate is then re-weighted using the weighting procedures developed for the full sample. The mean square error of the replicate estimates around the full sample estimate provides an estimate of the variance of the statistic. Replicate weights were calculated for regular districts (including separate weights for the two half-samples) and for secondary schools.

It was prohibitively costly and time-consuming to calculate jackknife-replicate standard errors for every school and district estimate presented in the Interim Report. Instead, we used the standard errors in Tables A.2 through A.5 as guides for determining confidence intervals. Based on this procedure, only percentage differences 5 or greater are considered meaningfully different. Where the text explicitly refers to statistically significant findings, these are based on statistical tests using the jackknife standard error estimates, or on the results of multiple regression procedures, for which jackknife standard error estimates cannot be calculated. The latter tests are likely to have a liberal bias (i.e., report as statistically significant some findings that are not).

Data Quality Issues

Nonresponse on individual questionnaire items is another potential source of bias. For those items where nonresponse was a significant problem, we either did not analyze the item, or limited the way in which it was used. The most critical items for which this was an issue were those asking about Perkins funding. These items had a low response rate and, where data were provided, were often of questionable reliability. We handled this problem in two ways. First, these data were generally used in a recoded 0–1 format (denoting whether or not any funding was received) rather than in dollar amounts. This recoded yes-no variable is more reliable than the specific dollar figures. Second, alternative questionnaire items were used to determine funding status for the recoded variable, which lowered this variable's nonresponse rate.

To provide more reliable data on Perkins funding amounts, states' Perkins finance records were collected (as described below). These records data were used for most analyses involving dollar amounts (primarily the analyses in Chapter 2).

Further information on the methodology for the Omnibus Surveys is provided in Chaney (1993).

Table A.2
Selected standard errors representing data from all regular secondary school districts

District characteristic	Percent reporting large increase in services for special populations from 1990-91 to 1991-92		Percent reporting state leadership in general in 1991-92 provided adequate support for vocational education		Percent that submitted their own local plan to receive 1991-92 Perkins funds		Mean percent of secondary students enrolled in vocational programs who are expected to be completers	
	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error
Total	11.9	1.1	55.5	2.0	31.7	1.2	55.0	1.5
Enrollment size								
Small	9.1	1.7	55.8	2.6	20.0	1.5	53.3	2.3
Medium	14.5	1.7	55.6	3.1	53.3	2.3	58.9	1.7
Large	28.4	2.5	53.0	2.2	81.9	2.3	54.7	1.7
Perkins funding status								
Funded in 1991-92	14.3	1.3	55.8	2.3	45.2	1.7	56.1	1.9
Not funded in 1991-92	7.5	2.0	50.7	4.2	9.9	2.0	55.5	3.3
Level of urbanization								
Rural	8.6	1.7	57.7	2.6	29.1	1.6	54.8	2.3
Suburban	15.5	2.2	51.7	3.1	31.0	2.0	54.7	2.4
Urban	27.2	0.0	56.5	0.0	76.6	0.0	59.2	0.0

Source: Chaney (1993)

Table A.3
Selected standard errors for data collected only for Version A secondary school districts

District characteristic	Percent with disabled students in vocational programs that provide tutoring or other individual attention to all disabled students		Percent reporting that funding vocational teachers trained to instruct special needs students is no problem		Percent with Limited English Proficient students enrolled in vocational programs		Percent with business and industry having major involvement in providing internships or co-ops	
	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error
Total	23.0	3.1	45.3	4.9	24.3	2.4	29.3	2.4
Enrollment size								
Small	23.9	5.2	51.2	8.7	16.3	3.3	20.4	2.8
Medium	23.6	4.2	35.0	4.7	36.2	5.9	48.3	3.6
Large	14.7	4.4	23.6	7.0	74.6	5.6	60.2	4.1
Perkins funding status								
Funded in 1991-92	25.0	3.6	43.0	3.9	29.6	2.9	34.4	3.9
Not funded in 1991-92	22.1	8.3	51.0	9.2	18.1	6.4	18.8	3.9
Level of urbanization								
Rural	25.0	4.7	46.7	7.6	15.9	8.1	24.8	2.8
Suburban	21.2	5.0	44.7	5.0	32.6	5.7	33.0	6.6
Urban	16.0	3.2	31.3	3.0	68.8	3.9	59.4	4.6

Source: Chaney (1993)

Table A.4
Selected standard errors for data collected only for Version B secondary school districts

District characteristic	Percent that started integrating curricula across vocational and academic courses before 1991-92		Percent currently collecting measures of school retention rates		Percent that started modifying curricula for tech-prep before 1991-92		Percent that increased proportion of academic credits required for graduation in past 5 years	
	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error
Total	41.5	3.6	75.1	4.6	22.6	2.3	78.0	2.4
Enrollment size								
Small	41.3	4.1	75.4	5.4	17.2	3.7	77.2	3.4
Medium	41.4	5.0	73.6	4.8	30.5	3.7	80.4	3.0
Large	43.6	8.9	78.7	3.9	30.4	3.7	77.2	3.9
Perkins funding status								
Funded in 1991-92	41.9	5.2	78.5	7.3	23.9	2.6	77.0	3.3
Not funded in 1991-92	42.4	6.7	69.0	5.7	18.0	5.8	80.3	9.6
Level of urbanization								
Rural	42.2	3.9	73.8	4.8	19.7	3.4	77.8	4.6
Suburban	39.6	7.9	77.2	5.6	26.3	6.1	78.1	4.4
Urban	46.9	4.3	76.4	3.4	28.7	3.8	80.4	3.3

Source: Chaney (1993)

Table A.5
Selected standard errors for data collected from secondary schools

School characteristic	Percent reporting change of 5% or less in vocational education enrollment from 1987-88 through 1991-92		Percent reporting moderate increase in assistance that district provides on guidance on assuring equal access		Percent entering into tech-prep program before 1991-92		Percent reporting that maintaining vocational enrollments is a serious problem	
	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error
Total	44.4	1.7	35.5	1.1	28.3	1.3	15.9	1.0
Type of school								
Regular	45.6	1.8	34.7	1.2	25.9	1.4	14.9	1.1
Vocational	18.6	1.4	45.1	1.8	54.9	2.2	26.0	1.4
Enrollment size								
Small	53.9	3.0	31.2	2.6	21.1	2.1	10.0	1.4
Medium	38.7	2.2	39.5	2.5	28.0	2.6	14.1	1.9
Large	34.1	2.5	38.6	2.0	39.0	1.8	26.1	1.7
Perkins funding status								
Funded in 1991-92	42.4	2.0	37.1	1.3	32.4	1.7	16.6	1.1
Not funded in 1991-92	47.1	4.1	31.4	4.3	18.3	3.5	14.9	3.4
Level of urbanization								
Rural	51.8	2.4	33.9	2.1	21.6	1.9	9.4	1.4
Suburban	38.6	2.5	36.1	1.8	30.7	3.0	19.7	2.1
Urban	35.6	2.8	37.9	2.2	39.1	2.5	25.8	1.7

Source: Chaney (1993)

NATIONAL ASSESSMENT OF VOCATIONAL EDUCATION TEACHER SURVEY

The National Assessment contracted with the National Center for Education Statistics (NCES) to develop and conduct a survey of vocational and academic public secondary school teachers.

The Teacher Survey collected data on the educational and occupational backgrounds of teachers, the nature of instruction in vocational classes, and teachers' perceptions of vocational education problems, using a two-page paper-and-pencil mail questionnaire. A copy of the survey instrument and an overview of survey findings are included in Heaviside, Carey and Farris (1993).

Sample Selection

The Omnibus Survey sample of 3,130 public secondary schools serving grades 11 and 12 was used as the sampling frame for the Teacher Survey. A two-stage sampling process was used to select teachers from this sampling frame.

In the first stage, a stratified sample of 395 secondary schools was drawn. Schools in the sampling frame were stratified by type of district and type of school (regular or vocational). Within each of the major strata, schools were sorted by size and region (northeast, central, southeast, and west). The allocation of the sample to the major strata was made in a manner that was expected to be reasonably efficient for national estimates, as well as for estimates for major subclasses. Schools within a stratum were sampled with probabilities proportionate to the estimated number of teachers in the school.

Teacher Sampling

In the second sampling stage, teachers were sampled from schools. To construct the teacher sampling frame, the 395 selected schools were asked to provide, in spring 1992, a list of all vocational and academic teachers in specified instructional areas. Teachers were defined by the subject area they teach most often. Eligible academic teachers were those teaching mathematics, science, English, social studies, and languages in the 9th to 12th grades. Eligible vocational teachers were those who teach **occupationally related** vocational education courses in the 9th to 12th grades.

Full- and part-time teachers were included in the teacher sampling frame, but itinerant teachers, substitute teachers, and teachers of special education, physical education, music, art, and non-occupational vocational education were excluded. A list of 15,000 secondary teachers was compiled from this procedure, and a final sample of 2,376 teachers was drawn, including 1,464 vocational and 912 academic teachers. Teachers were selected so as to permit separate estimates of teachers' responses by major subclasses, including type of teacher (vocational or academic) and type of school (vocational or regular).

Data Collection

The National Assessment of Vocational Education Teacher Survey was administered from October 1992 to January 1993. The survey administration consisted of one mail-out and telephone follow-ups.

During data collection, 305 teachers were found to be out of scope (no longer at the school or otherwise not eligible), leaving 2,071 eligible teachers in the sample. From these, responses were obtained from 1,924 teachers. The final response rate was 91 percent (98 percent for schools multiplied by 93 percent for teachers). Item nonresponse was less than 2 percent on every item.

Weighting and Reliability of Estimates

The response data were weighted to adjust for the variable probabilities of selection and for differential nonresponse. A final poststratification adjustment was made so that the weighted teacher counts equaled the corresponding Common Core of Data (CCD) frame counts within cells defined by school size, metropolitan status, and region.

Estimates of standard errors were computed using jackknife replication. To construct the replicates, 30 stratified subsamples of the full sample were created and then dropped one at a time to define 30 jackknife replicates. The standard error of these replicates provides the jackknife standard error estimate.

As was done for the Omnibus Surveys, selected jackknife standard errors were computed, and used to establish confidence intervals for general analysis purposes. Based on this procedure, the confidence interval for these data was also set at ±5 percent.

THE SURVEY OF STATE VOCATIONAL SEX EQUITY ADMINISTRATORS

State vocational sex equity administrators oversee the 10.5 percent of Perkins funds set aside for state-administered sex equity programs and programs for single parents, single pregnant women, and displaced homemakers. They are a valuable source of information on these programs.

The Survey of State Vocational Sex Equity Administrators was developed by the National Alliance for Partnerships in Equity, in conjunction with the Vocational Education Equity Council. National Assessment staff provided input to ensure that issues of interest to the assessment were included.

The survey covered issues related to the roles and responsibilities of state sex equity administrators; the distribution of Perkins funds for programs for sex equity, single parents, single pregnant women, and displaced homemakers; and the perceived effects of the Perkins Act on state and local efforts. The survey consisted of a paper-and-pencil mail questionnaire administered to all state sex equity administrators.

Sample Selection

The sample was a census of all state vocational sex equity administrators. A list of all such administrators was constructed by merging lists from the National Displaced Homemaker Network and the National Alliance for Partnerships in Equity. The final list included administrators from all 50 states, the District of Columbia, Guam and Puerto Rico. Since ten states had two administrators, 63 administrators were included on the final list. (The survey administration revealed an additional three states with two administrators, but these three administrators were not surveyed.)

Data Collection

Surveys were administered in Spring 1992, the end of the first year of 1990 Perkins Act implementation. The data collection included two survey mail-outs and telephone follow-ups. A total of 53 surveys were completed, for a response rate of 84 percent. However, in two states that have two administrators, these administrators collaborated and returned one survey for both; if this is taken into account, the response rate increases to 87 percent.

Weighting and Reliability of Estimates

Since the sample was a census, the data did not need to be weighted for sampling error, and did not require standard error estimates. The data were not adjusted for nonresponse.

Follow-up Survey

To obtain the most recent data possible on key items from the Sex Equity Administrator Survey, some items were administered to attendees of the National Alliance for Partnerships in Equity annual conference in March, 1993. These survey items were completed by 30 administrators attending a conference session discussing the National Assessment of Vocational Education. Since this sample could be biased, the data from this follow-up should be interpreted with caution.

STATE RECORDS DATA COLLECTION

As mentioned above, the data on Perkins funding amounts obtained from the Omnibus Surveys were problematic. Since these data are of critical importance in addressing a number of Congressional concerns regarding the Perkins Act, the National Assessment sought another, more reliable source of funding information.

The National Center for Research in Vocational Education (NCRVE) provided this source. In 1992, the NCRVE, in cooperation with the National Association of State Directors of Vocational and Technical Education and the National Assessment of Vocational Education, collected administrative record data on local Perkins funding allocations directly from state agencies.

To collect these funding data, the NCRVE sent a letter to each state director of vocational education requesting a copy of their secondary and postsecondary Perkins funding allocations, and the formula or rules used to make allocations under the 1990 Perkins Act. State directors in all 50 states, the District of Columbia, and the six U.S. territories that receive Perkins funds were contacted, using a list supplied by the National Association of State Directors of Vocational and Technical Education.

Each state director was asked to provide records data on funding allocations made under the 1984 and 1990 Perkins Acts. These included allocations for 1990–91 Perkins Title II Part A funds (disadvantaged, disabled, and adult set-asides, and sex equity and single parent funds), Title II Part B funds (for program improvement), and Title III consumer and homemaking funds; and for 1991–92 and 1992–1993 allocations, Title II Part B funds (sex equity and single parent funds), Title II Part C funds (basic local grants), and Title III funds for consumer and homemaking and for tech prep.

Data collection began with the initial letters to state directors in March, 1993 and ended with final telephone follow-ups in October, 1993. The telephone follow-ups were used to convert non-response cases and to clarify inconsistent or incomplete data.

Data were collected in whatever form the states could provide, and were then edited and entered into an electronic data base. All allocations made to institutions or organizations other than local public schools, school districts, or postsecondary institutions were deleted from the data base. Since excluded recipients typically received funding under only the 1984 Perkins Act, deleting these organizations underestimates the impact of the 1990 Perkins formula in targeting resources on educational institutions.

For some analyses, the 1990–91 Title II set-asides and program improvement funds were combined and labeled "basic grants," comparable to the later-years' Title II Part C basic grant funds.

A total of 47 states provided funding information, with complete basic grant information provided by 45 states.[3] Washington state was unable to supply complete 1991–92 secondary allocations, and Virginia was unable to supply postsecondary allocations. Some additional states were unable to provide complete information on Perkins funds awarded through competitive grants.

The records data appear to be, in general, more reliable than the Omnibus Survey funding data; however, we are still reviewing some discrepancies in these records data. The state records data provide the main source of information for Chapter 2 in this report, although they were available too late to be used in other chapters. Those chapters use the more reliable forms of Omnibus Survey funding data (as explained above).

Further information on the State Records Data collection is available in Klein et al. (1993).

NATIONAL CENTER FOR EDUCATION STATISTICS (NCES) STUDIES

In this section, we provide a brief overview of the NCES studies used in the Interim Report, and how these data were modified or adapted for use in the National Assessment. These descriptions are drawn largely from Davis and Sonnenberg (1993).

The High School Transcript Studies

High school transcript studies provide records of students' coursetaking that can be used to examine the nature and extent of vocational coursetaking. These studies also include basic background information on students, which can be linked to transcript records to examine coursetaking patterns for different types of students (e.g., males versus females, students with different high school grades).

Since 1980, the U.S. Department of Education has conducted three high school transcript studies. The first was part of the High School and Beyond (HSB) first follow-up survey in 1982. About 15,000 transcripts were collected from school records for HSB sophomore cohort students who were seniors in 1982. The second transcript study was the 1987 High School Transcript Study. This study surveyed approximately 34,000 seniors who had participated (as 11th graders) in the 1986 National Assessment of Educational Progress (NAEP). The 1990 High School Transcript Study is the most recent transcript study; it includes 23,000 transcripts collected from school records for students who participated in the 1990 NAEP as 12th-graders.

Courses in all three transcript studies were coded using the classification of secondary school course (CSSC) codes, which are based on course titles and catalog descriptions. In each study, course files were linked to student background information and, in the NAEP studies, to student assessment scores. Details on the methodology for each of these transcript studies are provided in the following reports:

- Legum et al. (1993) and Caldwell et al. (1993) for the 1990 NAEP transcript study,

- Thorne et al. (1989) for the 1987 NAEP transcript study,
- Jones et al. (1983) for the 1982 HSB transcript study.

The National Assessment used the 1990 transcript study to examine recent patterns of participation in vocational education, and compared these with data from the 1987 and 1982 transcript studies to examine trends in vocational participation. For these analyses, the samples were restricted to public school students who had graduated in 1982, 1987, or 1990, and for whom complete transcripts were available. This resulted in final sample sizes of 9,510 for the 1982 HSB; 24,426 for the 1987 NAEP; and 16,456 for the 1990 NAEP.

Every effort was made to ensure that samples were comparably defined across years. However, differences in the sampling and variables used in these studies limit comparisons of certain student subgroups. For example, economically disadvantaged students can be identified on the 1982 HSB transcript study, but not in the 1987 or 1990 studies.

The Secondary School Taxonomy[4]

Prior to analysis, all course records data from the transcript studies were coded using the Secondary School Taxonomy. This taxonomy consolidates individual course titles into more general and comparable course categories. The taxonomy was developed as part of the last National Assessment to facilitate the analysis of the 1982 HSB transcript data; it has been used for numerous NCES studies and is well accepted for research purposes.[5]

The Secondary School Taxonomy categorizes the secondary curriculum first into three branches: academic, vocational, and personal/other. The academic curriculum is then divided into six subject areas (mathematics, science, English, social studies, fine arts, and foreign languages).

The vocational curriculum is divided into three curricular areas — consumer and homemaking education, general labor market preparation, and specific labor market preparation. Consumer and homemaking courses provide training and skills that are often necessary for activities outside of the paid labor force (e.g., child development, family health, foods and nutrition). Classes that impart basic skills that can be applied in a variety of personal or occupational settings are included in general labor market preparation; these courses include beginning typing, industrial arts, work experience and career exploration, business math, and business English. Specific labor market preparation includes introductory, advanced, and elective courses in seven occupationally related vocational areas: agriculture, business, marketing and distribution, health, occupational home economics, trade and industry, and technical and communications.

The personal/other curriculum is further divided into four categories: general skills, health (nonvocational), religion, and military science. General skills include courses such as physical education and driver's education.

The National Postsecondary Student Aid Study

The National Postsecondary Student Aid Study (NPSAS) is a nationwide study of students enrolled in less-than-two-year postsecondary institutions, community and junior colleges, four-year colleges, and major universities located in the United States and Puerto Rico. Undergraduate, graduate, and first-professional students who receive financial aid, as well as those who do not receive aid, participate in the NPSAS.

The NPSAS was originally developed to provide information on financial aid programs and their effects, but is also useful for other purposes, such as determining the nature and extent of participation in postsecondary education. It collects information on student demographics, family income, education expenses, employment, education program and aspirations, parental demographic characteristics, parental support, and how students and their families meet the costs of postsecondary education. A major advantage of the NPSAS is that it includes data from proprietary institutions, which are often excluded from other postsecondary data collection efforts.

The first NPSAS was conducted during the 1986–87 school year. Data were gathered from institutional records on about 60,000 students at 1,100 postsecondary institutions. About 43,000 of these students and 13,000 parents also completed questionnaires.

The second NPSAS was conducted in 1989–90. This study collected information from institutional records on about 69,000 students at 1,130 postsecondary institutions. About 51,400 students and 16,000 parents also completed computer-assisted telephone interviews.

The National Assessment of Vocational Education used the undergraduate samples of both the 1986–87 and 1989–90 NPSAS to examine recent patterns of participation in postsecondary vocational education, and changes in participation over time.

Data Comparability

Most of the data collected in the 1986–87 and 1989–90 NPSAS are comparable, but differences in the sampling for the two studies impose limits on over-time comparisons. In the 1986–87 NPSAS, school records and student interviews were collected in the fall of 1986. The 1989–90 sample was initially drawn in the fall of 1989, but it was periodically refreshed during the year. As a result, students who were not enrolled in the fall but enrolled later in the school year were also included in the 1989–90 sample. However, these data include a variable that enables users to restrict the sample to students enrolled in the fall, permitting comparisons with the 1986–87 NPSAS sample. In this report, we used the full-year 1989–90 sample when examining recent enrollments, and the fall-only 1989–90 sample when examining changes from 1986–87 to 1989–90.

The National Assessment samples include 34,544 undergraduates in the 1986–87 sample, 46,788 undergraduates in the full-year 1989–90 sample, and 40,324 undergraduates in the fall-only 1989–90 sample. These data were analyzed using STRATTAB, a proprietary program developed by MPR Associates; this program uses a Taylor series approximation technique to estimate standard errors for statistics derived from complex sampling designs.

Details on the methodology for the 1989–90 NPSAS are available in Shephard and Malizio (1992), and in Tuma (1993). The 1986-87 NPSAS is described in Smith, Garcia and Malitz (1990).

The Schools and Staffing Surveys

The Schools and Staffing Surveys (SASS) were designed to provide information on the characteristics of secondary school teachers and administrators and their workplaces. The SASS is a comprehensive data base of information on public and private secondary education derived from four survey instruments: the Teacher Demand and Shortage Questionnaire, School Questionnaire, School Administrator Questionnaire, and Teacher Questionnaire.

The SASS was administered for the first time in 1987–88 and for the second time in 1990–91; a third administration is currently underway for school year 1993–94.

Schools are the primary sampling units for the SASS, with a sample of teachers selected from each school. Public school districts are included in the sample when one or more of their schools is selected. The 1990–91 SASS, like the 1987–88 SASS, drew a probability sample of approximately 12,800 schools (9,300 public and 3,500 private), 65,000 teachers (52,000 public and 13,000 private), and 5,500 public school districts.

We used only the public sector questionnaires from the 1990–91 SASS for the National Assessment's analyses of teacher characteristics and teacher shortages. The 1990–91 Teacher Demand and Shortage Survey was used to examine potential shortages of vocational teachers, and the 1990–91 Public School Teacher Survey was used to examine vocational teachers' demographic characteristics and educational backgrounds.

The 1990–91 public school sample was selected from the 1988–89 Common Core of Data universe list maintained by NCES. All public schools in the file were stratified by the 50 states and the District of Columbia, and then by three grade levels (elementary, secondary, and combined). A special sample of schools serving large numbers of American Indian or Alaskan Native students was also drawn to provide national estimates of their schools, teachers, and principals. Due to confidentiality restrictions, the supplemental sample of American Indian and Alaskan Native institutions was not included in our analyses.

Teachers were sampled from within selected schools, with an average of three to nine teachers sampled per school (depending on school type). The samples were drawn from lists of teachers supplied by the selected schools. The SASS data were collected from December, 1990 to June, 1991, using two survey mail-outs and telephone follow–ups.

Defining Teachers

The teacher sample used for our analysis was restricted to public school teachers in grades 9–12. From this sample, special education teachers were identified as those reporting that 50 percent or more of their courses are special education. Vocational teachers were then defined as those reporting that 50 percent or more of their courses are vocational education. Vocational courses were defined using the categories listed on the SASS Public School Teacher Questionnaire, which includes agriculture, business and marketing, industrial arts, health occupations, vocational and nonvocational home economics, trade and industry, technical, accounting/bookkeeping, shorthand, typing, career education, and "other" vocational education. In contrast to the vocational teachers in the National Assessment of Vocational Education Teacher Survey, the vocational teachers in this sample includes those teaching non-occupational vocational courses. All remaining teachers were identified as non-vocational, non-special-education teachers (academic teachers).

In cases where course load responses were not provided, teachers' reports of the subject they teach most often were used to classify teachers as special education, vocational, or academic. It is important to note that teachers who primarily provide vocational training to special education students, but who consider themselves special education rather than vocational education teachers, are not included in the sample of vocational teachers.

Data Limitations

While the SASS provides a reliable, nationally representative sample of vocational and non-vocational teachers, it has two major drawbacks for our purposes. First, the SASS does not include data on whether teachers have non-teaching work experience in a field related to their teaching position, which is an important aspect of vocational teachers' qualifications. Second, the SASS does not consistently distinguish between occupational and non-occupational vocational teachers (the latter group includes consumer home economics and industrial arts teachers). These limitations were avoided in the National Assessment of Vocational Education Teacher Survey (discussed above).

The methodology for the SASS is described in more detail in Choy et al. (1993, Appendix C) and in Kaufman and Huang (1993).

THE OMNIBUS COMMUNITY CASE STUDIES

The Omnibus Community Case Studies provide a more in-depth view of the issues covered by the Omnibus Surveys. These case studies included 20 selected communities across the country, with a community defined as an area containing one local secondary education agency; at least one comprehensive high school; at least one area vocational school or district-supported vocational high school; and at least one two-year public postsecondary institution within reasonable commuting distance. This definition proved adequate for urban areas, but sometimes had to be loosened to provide sample sites in suburban and rural areas.

Sample Selection

From the Omnibus Survey school and district samples (discussed above), 20 sites where at least one institution responded to the surveys were selected as Omnibus Community Case Study sites. The original sample selection provided for 40 sites, 20 main sites, each with an alternate site matched on the dimensions listed below. In the final sample, one site declined to participate and one site could not participate for other reasons; both were replaced with their alternate sites.

Sites were selected so that:

- All four U.S. regions would be represented, with at least two sites in each region; and the largest or second largest district in each region would be selected with certainty;

- At least ten states would be represented, including at least two of the five smallest states;

- After the four largest urban areas were selected, the remaining sites would represent a balance of urban, suburban, and rural areas;

- Sites would be selected to reflect wide variation in area poverty, unemployment, the secondary/postsecondary Perkins funding split, general industrial composition, and minority population composition; and

- Selected sites would include nonrecipients as well as recipients of 1990 Perkins funding.

These criteria were generally met. The final sample included sites from 18 states, ranging from scattered rural areas to some of the country's most densely populated urban areas. Secondary district enrollments at the visited sites ranged from 180 students to 247,000 students. The minority population in the communities ranged from nearly nonexistent to over 80 percent, and the local economies ranged from severely depressed to robust. A wide variety of local and state educational approaches and philosophies were represented as well. All but one of the visited communities had some type of secondary vocational school, and every site had a two-year public postsecondary school (usually a community college).

The selected sites (given pseudonyms to protect their anonymity) are briefly described below. They are listed roughly in order of size from smallest to largest, based on secondary district enrollments.

- **Farmville**. This is the smallest case study district, with fewer than 200 students attending one high school. It is in a rural agricultural community in a south central state, with one comprehensive high school, one distant area vocational school (not visited), and a postsecondary institution in transition from a vocational school to a technical college.

- **Dry Gulch**. This is a rural community in a southwestern state. The majority of the population is first- or second-generation Hispanic. The secondary district has a single high school and a postsecondary institution located about 45 miles away. The local area vocational school was not visited.

- **Rolling Woods**. This community is located in a rural depressed area of an eastern state, within an hour's drive of a major metropolitan area. The site includes a state-run area vocational school, which serves 14 school districts in three counties, and a community college, which serves two of the three counties. The secondary district at this site was not visited.

- **Garden Park**. This site is a one-high-school community in the least populated section of a rapidly growing eastern population corridor. The population is over 80 percent white. The site visit included the high school, one of two area vocational schools (serving five county schools), and a community college.

- **Green Glade**. A sparsely populated area in a sparsely populated northeastern state, this community has a majority white population. The site visit included the secondary district's single high school, one of two area vocational-technical centers, and three community colleges.

- **Louisville**. This majority-white community is in a depressed area of an eastern state that was once a prosperous industrial area. The site visit included the district's one high school (which the state had designated economically depressed), the area vocational school, and the community college, which is located directly across the street from the vocational school.

- **Southern Pines**. This community is composed of a small town district and a surrounding county district in a southern state. The community is about 70 percent white and 30 percent black. The site visit included the district's single high school, as well as the vocational center in the town. A local community college, serving a seven-county area, was also visited.

- **Mountain View**. This is a rapidly growing suburban area in a northwestern state. The majority of the population is white and upper-middle class. The site visit included the only high school in the district, a consortium-based area vocational school serving students from this and, primarily, another district, and the local community college.

- **High Plains**. Located in the mountains of the west, this majority white community is the most populous in its state. This site visit included one of three district high schools and the local community college, the only postsecondary institution in the county. The community has no area vocational school within commuting distance.

- **Riverdale**. This community is a small, majority white city in a central-midwestern state. The site visit included one of two district high schools, an area vocational school serving students from 20 schools in 11 districts, and a vocational-technical college serving seven counties.

- **Central Crossing**. This is a small, majority white city in the same state as Riverdale. This site visit included one of two district high schools, an area vocational school serving 10 schools in seven districts, and a local technical college.

- **Flatlands**. This community is in a southwestern state. Its area vocational school is regarded as one of the best in the nation. In addition to that school, the site visit included a one-high-school district, and a large community college.

- **River Station**. This majority black community is in a medium-size city in the central United States, where formerly blue collar jobs are being replaced by service jobs. Five of seven district secondary schools are magnet schools. The site visit included the district's vocational/cooperative school and the local community college.

- **Magnolia**. This community is a majority-white suburb of a large southern city. The visit included one of 16 district regular high schools as well as one of its three vocational schools, and a technical college, one of three local two-year institutes.

- **Harbor View**. This community is a major city in the northeast, with a lower minority population than some major cities. The visit included one of the district's 12 regular high schools, its one occupational high school, and two local postsecondary institutions.

- **West Pacific**. This is a large district in a western state. Its population is 76 percent white and 24 percent minority, primarily Hispanic and Asian. Four of the district's approximately 20 high schools were visited, as were multiple facilities run by the local three-campus community college.

- **Western Desert**. This is a large community in a western state, with a majority white population and a burgeoning economy. The site visit included one of about 20 district regular high schools, both of the district's vocational schools, and one of three campuses of the local community college.

- **Big Sky**. This community is a large, majority white urban community in a southwestern state. The school district is about 40 percent black and 40 percent Hispanic. The visit included four of approximately 34 high schools, and the occupational magnet school. One of six branches of the local community college was also visited.

- **Lake View**. This is a major urban center in the central part of the country, with several ethnically distinct communities. The city is majority black. The site visit included five of about 65 high schools, including one vocational school and others that specialize in particular vocational areas such as business and agriculture.

- **Portside**. This community is a major eastern urban center, with a mix of minority and ethnic populations, including many recent immigrants. Of its more than 100 high schools, the site visit included a business high school, a vocational/cooperative education high school, and a comprehensive magnet school. The visit also included a technical college, a college with two-year and four-year programs, and an adult learning center.

The goal of the site selection process was to pick sites that collectively provide sufficient variation in local communities so that most major types of situations with respect to the implementation and effects of the Perkins Act and funding for vocational education would be visited. However, the selected sites are not representative in a statistical sense of any areas, districts, schools, vocational programs, students, or other education-related populations.

Data Collection

The case study site visits were conducted from November, 1992 to March, 1993, the second year of implementation of the 1990 Perkins Act. Immediately prior to the beginning of data collection, all interviewers participated in a three-day training session that included training for both the Community Case Studies and the Funding Case Studies (discussed below).

Two interviewers participated in each site visit, with each visit lasting from one to two weeks. Each site visit included interviews with as many of the following individuals as possible: district superintendent, director of vocational education, finance officer, and directors of programs for special population students (disabled, disadvantaged, limited English proficient); principal or dean and other school administrative staff, teaching staff, counselors, and students at regular high schools, vocational high schools, and postsecondary institutions; parents of high school students; and business and community representatives. Teacher and student interviews included both academic and vocational teachers and students. Group interviews were used for teachers, students, parents, and business and community representatives.

Not every type of respondent could be interviewed at each site. Parents were a particularly difficult group; they often refused to be interviewed, or failed to appear for scheduled interviews.

Site visits also included tours of institutions' facilities and observations in vocational classrooms whenever possible.

Verification of Omnibus Survey Data

The case study researchers also verified many Omnibus Survey responses by comparing completed Omnibus Survey forms to data obtained during the site visits. This verification process provided further evidence of the limited reliability of the Omnibus Survey funding questions. Other survey questions were found to be of acceptable reliability.

Further information on the Community Case Studies is available in Milne et al. (1993).

FUNDING CASE STUDIES

The 1990 Perkins Act significantly changed the way local basic grant funds are allocated and used. The funding case studies were designed to collect in-depth information on the effects of these changes on local school districts. For these case studies, eight sites were selected from the Omnibus Survey regular district sample, including four sites with large increases in Perkins funding and four with large decreases. The Funding Case Studies were limited to the secondary level because of time and cost limitations.

Sample Selection

The Funding Case Study sample was selected primarily on the basis of changes in districts' Perkins funding from 1990–91 to 1991–92. Changes in Perkins funding were determined by comparing 1991–92 Perkins basic grant allocations (Title II Part C) with the 1990–91 funds that were combined to form these basic grants — program improvement funds and the disabled, disadvantaged, and adult set-aside funds (Title II Part B and sections of Part A). Ideally, data for these comparisons would have been obtained from the State Records Data Collection; however, these data were not available at the time the sample needed to be drawn. Instead, we used funding data from the Omnibus Surveys, with follow-up telephone calls to verify the Omnibus Survey funding information before final sites were selected.

Sampling began by ordering respondents to the Omnibus regular school district questionnaires by the size of their Perkins funds gain or loss. Districts with gains or losses of less than $100,000 were excluded from consideration. The following steps were then taken to select the final sample:

- To ensure that the sample would reflect variation in district size and locale (urban, suburban, rural), districts were classified by the size of their gains or losses into the following categories:

  GAIN CATEGORIES: More than $1 million; $500,000 to $1 million; $250,000 to $499,999; $100,000 to $249,999

  LOSS CATEGORIES: More than $1 million; $200,000 to $1 million; $100,000 to $199,999

  The loss categories were broader than the gain categories because there was less variability in the size of Perkins funding losses than gains. For example, only 21 Omnibus sample districts experienced losses greater than $100,000 and only three had losses greater than $500,000.

- In addition to absolute dollar shifts in funding, the relative impact of fiscal changes is an important factor. For example, a loss of $200,000 is likely to have a greater impact on a district's vocational programs when that sum represents a 50 percent funding cut than when it represents a 10 percent cut. Thus, within each gain and loss category, districts were selected in which the dollar change in funding also represented a relatively large **percentage change** in Perkins funds.

- From these districts, sites were selected to represent a variety of different funding change patterns. Funding patterns selected for inclusion were: a district that received Perkins funding in 1991–92 but not in 1990–91; a district that had an increase in Perkins funding while the total educational budget declined; a district with a decrease in Perkins funding when the total educational budget remained stable; and a district with decreases in both Perkins funding and total educational funding.

- Finally, main and back-up sites were selected to ensure adequate geographic diversity across the country, and to avoid overlap with the community case study sites.

The final sites selected for case studies, while not statistically representative of the nation, reflect a range of school districts. Four of the eight sites were large cities: one in the northeast, one in the south, one in the midwest, and one in the west. Two other sites were suburban county school districts, one served the suburban area near a medium sized city, and one was predominantly rural. Table A.6 lists the funding characteristics of the selected sites.

Table A.6
Changes in basic grants received by case study sites, 1990–91 to 1991-92

	1990–91 Basic Grant	1991–92 Basic Grant	Difference	Percent Change
Increase Funding Sites:				
Site A — Big city	292,205	1,353,265	1,061,060	363.1
Site B — Big city	636,433	1,281,132	644,699	101.3
Site C — Big city	263,277	1,377,834	1,114,557	423.3
Site D — Suburb	113,869	243,140	129,271	113.5
Decreased Funding Sites:				
Site E — Big city	2,309,000	1,302,000	-1,007,000	-43.6
Site F — Rural	163,587	53,984	-109,603	-67.0
Site G — Suburb	203,965	31,931	-199,034	-86.2
Site H — Suburb	914,272	764,375	-149,897	-16.4

Source: State Administrative Records

Data Collection

The Funding Case Studies were conducted concurrently with the Community Case Studies, from November, 1992 to March, 1993. Immediately prior to the beginning of data collection, all interviewers participated in a three-day training session that included training for both the Funding Case Studies and the Community Case Studies.

Teams of two researchers visited each site for approximately five days. Prior to each site visit, district central office personnel were contacted and instructed as to what documents the site visitors would need to review. On site, the researchers began each visit by reviewing budget and enrollment records, and transcribing relevant funding information onto a standard data collection form. Interviews were then conducted with as many of the following individuals as possible at each site: superintendent, district director of vocational education, finance officer, district coordinators of special population programs, school principals, department heads, counselors, and teachers. Students were interviewed informally in conjunction with classroom visits.

The interviews focused on determining shifts in services, staff, and students, and other impacts of funding changes. Specific issues covered included not only quantitative changes, but also respondents' impressions of the process surrounding these changes. Topics included: persons (at state, district, and school levels) involved in the changes; preparation for the changes in the form of preservice or in-service training; support structures provided for personnel experiencing re-assignment; pressures brought to bear on unchanged funding sources (general revenues as well as other targeted funds) and responses to those pressures; and adaptation to lost (or gained) administrative and support personnel.

The Funding Case Studies are summarized in Hoachlander et al. (1993).

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ENDNOTES

[1] In addition to these data collection efforts, the Interim Report relies on information from commissioned literature reviews and published research articles. These are cited in the reference list at the end of the report and are not discussed here.

[2] The discussion of the Omnibus Surveys draws heavily from the Methodology Appendix in Chaney (1993).

[3] Alaska, New Hampshire, Wyoming, and the District of Columbia did not provide information. None of the territories responded to the initial letter, and no further contact was made with these territories.

[4] This desription is drawn from Hoachlander (1992).

[5] For a detailed description of this taxonomy, see Gifford, Hoachlander, and Tuma (1989).

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LIST OF ACRONYMS

AACJC	American Association of Community and Junior Colleges
AFDC	Aid for Families With Dependent Children
AVS	Area Vocational School
BIA	Bureau of Indian Affairs (U.S. Department of the Interior)
BPS	Beginning Postsecondary Study
CATI	Computer-Assisted Telephone Interview
CBO	Community-based organization
CCD	Common Core of Data
CORD	Center For Occupational Research and Development
CUR	Course Utilization Rate
DECA	Distributive Education Clubs of America
ED	(U.S.) Department of Education
ESEA	Elementary and Secondary Education Act
ESL	English as a Second Language
FFA	Future Farmers of America
FLIT	Functional Literacy Project
GED	General Education Development
GPA	Grade Point Average
HHS	(U.S.) Department of Health and Human Services
HSB	High School and Beyond
IDEA	Individuals With Disabilities Education Act

IEP	Individualized Education Plan
IPEDS	Integrated Postsecondary Education Data System
JTPA	Job Training Partnership Act (U.S. Department of Labor)
LEA	Local Education Agency
LEP	Limited English Proficient
MDRC	Manpower Demonstration Research Corporation
NABE	National Association for Bilingual Education
NAEP	National Assessment of Educational Progress
NAVE	National Assessment of Vocational Education
NCES	National Center for Education Statistics
NCRVE	National Center for Research in Vocational Education
NELS	National Education Longitudinal Study
NLS72	National Longitudinal Study of the High School Class of 1972
NLSY	National Longitudinal Study of Youth (U.S. Department of Labor)
NLTS	National Longitudinal Transition Study of Special Education Students
NOCTI	National Occupational Competency Testing Institute
NPSAS	National Postsecondary Student Aid Study
OERI	Office of Educational Research and Improvement
QED	Quality Education Data
RFP	Request for Proposal
SASS	Schools and Staffing Survey

SCANS	Secretary's Commission on Achieving Necessary Skills (U.S. Department of Labor)
SES	Socioeconomic Status
SIPP	Survey of Income and Program Participation (U.S. Department of Health and Human Services)
SREB	Southern Regional Education Board
T&I	Trade and Industry
VSO	Vocational Student Organization

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